NEW-YORK FARMER,

AND

AMERICAN GARDENER'S MAGAZINE.

VOL. IX.] PUBLISHED MONTHLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT THREE DOLLARS A-YEAR, IN ADVANCE. [No. 11.

D. K. MINOR, and GEO. C. SCHAEFFER, } EDITORS AND PROPRIETORS.

FOR NOVEMBER, 1836.

NEW SERIES—VOL. IV.

STATE HISTORICAL SOCIETY
816 STATE STREET
MADISON, WISCONSIN 53706

☞ *This number of the New-York Farmer consists of two sheets—the postage therefore is three cents for any distance under, and five for any distance over, one hundred miles.*

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NOVEMBER 1, 1836.

We give the following communication a place with pleasure, and hope soon to receive another from the same source, which, if it carries out the *intention* of the writer as expressed in the first paragraph, will be equally acceptable and useful to us, as we doubt not the answers of Col. Randall, which we hope soon to publish, will be to C. and other of our readers.

The *name* of our correspondent is not *essential* to ensure a place in this work; yet it is always highly *gratifying* to us to know to whom we are indebted for favors of any kind. May we not, therefore, with propriety ask, that correspondents will favor us with real names, as well as initials?

It may be proper for us to say, that we shall be much obliged by receiving the information sought for in the following communication, at the earliest convenience of the gentleman to whom it is addressed.

For the New York Farmer.

Dear Sir,—I took up, at the house of a friend, two or three days since, the September number of your valuable paper, to which I intend soon to become a subscriber. Among the articles of interest, my attention was particularly directed to one on *Sheep*, over the signature of H. S. Randall, of Cortland. With Col. Randall I have the pleasure of an acquaintance—a gentleman who has given up a profession for a farm, and who displays the most praiseworthy zeal to advance the interests of agriculture. The testimony of such men is valuable; and in the remarks which follow, it is not my design to call in question *what* he has written, but to call forth more *particular* information on points on which I, in common with many others, have long entertained doubts.

Col. Randall states that his "grown (Saxon) ewes averaged 3 lbs. of wool per head, this year." Does he mean to be understood that this is any thing like the average weight of fleece of Saxon sheep in general, even in the best of flocks? If I have been correctly informed, *his* sheep have been selected with great care, only 15 or 20 in a place, from the choicest flocks. I would ask if *such* can be considered any just criterion of the breed in general? Without this explanation, his remark might convey erroneous impressions. Does Col. R., or any other man, believe that a Saxon flock can be kept up to this standard in the weight of their fleeces, without prodigious pains, and annually throwing out a considerable portion of the increase? If they can, and without sacrificing their present fineness, all question between them and the Merino, or indeed any other breed of sheep, is settled.

I wish to ask Col. R. for a little more explicit information in respect to the "relative ruggedness of the Saxon and Merinoes." The Merino, he says, will "bear the most abuse." Is not the Merino the toughest animal, and does not the Saxon require pampering and nursing to carry them through a severe winter in good order? How were his Saxons, "which stood up to their racks during the intensest cold, uncurled and remained fat," *last* winter, fed and otherwise treated? If my curiosity is not impertinent, I should be glad of his answer to the foregoing inquiries.

Yours, truly, C.

Norwich, Sept. 30th.

From the Key West Enquirer.

FLORIDA ARROW ROOT.

The day we trust is not far distant when prejudices in favor of the productions of foreign countries will cease to operate to the detriment of the agriculturists and manufacturers of our own. We are sufficiently friendly to the policy and principle of free trade, to allow every man to exercise the most perfect freedom in the purchase of whatever he may require, whether the necessaries or luxuries of life, at whatever price he may think proper, yet we cannot but lament the blindness or perverseness that lead any one to overlook an article of home manufacture supplied at comparatively a low price, for one of foreign production in no way superior and truly considered "a dear artirle." The arrow root which is the growth of South Florida, may be considered one of the home productions which are sacrificed to the undue preference for those imported. Equally white, equally pure with that of Jamaica, heretofore deemed the best, and by many thought to be the most nutritious of the two, there can be no reason for its not superseding the necessity of supplying market with any o the articles from abroad.

We have no price current at hand giving the value of the imported article in first hands, but we are well assured that it cannot be imported at less than from two or three times the price of that manufactured in this vicinity, which is from 6 to 8 cts. per lb. With an increase of demand, the aid of machinery would be required, and diminution in price might be anticipated; at present a similar mode of manufacture to that followed abroad is pursued in Florida, though it is probable that Florida manufacturers possess not all the facilities of their competitors.

We are not sufficiently versed in botany to pronounce upon the similarity of the Florida root to that of Jamaica or Bermuda, but there can be no doubt of their belonging to the same family of plants. The quantity manufactured is sufficient for the present demand, and doubtless will increase, as the root is indigenous, and but two or three planters being at present engaged in the manufacture, and that too, in connection with their other agricultural pursuits.

The low price at which the Florida arrow root is sold, allows of its being applied to other purposes than those to which, from its dearness, foreign arrow root was usually restricted. For instance, it is used here almost universally, in the place of starch, and no one can visit Key West without being positively satisfied of the fitness of the substitute. It is so extremely valuable in the composition of many nicities of the table (a fact which we have made known for the particular edification of our fair readers,) and particularly in an imitation *Best Mung*. It is used by the planters in some places as a bread stuff, and was so used by the aborigines, but do not ask it for so general a use as to have it supersede the use of either wheat or rye.

We shall rest satisfied if our notice secures for the manufacturers as great a demand as the goodness of their arrow root deserves.

From the Farmers' Register.

ACCOUNT OF A SHEEP ON TWO LEGS.

CRAWFORD COUNTY, PA. July 18, 1836.

As any thing of interest connected with domestic animals would be gratifying to you to know, allow me to give you an account, in few words, of a *lamb* which walked on two legs.

Being on a visit to a friend of mine some short time since, my attention was directed to a lamb, which from having been brought forth unexpectedly to the owner, in a very inclement season early in the spring, lost both of its hind legs very near the body.—The poor animal was suffered to live—and when I saw it, it could travel (upon its two fore legs) as nimbly as any of the flock, and that without raising the hind quarters, so that the centre of gravity should fall upon the fore legs. I consider the circumstance of a nature most extraordinary, and well worthy to be recorded. The animal must be endued with extraordinary muscular power: its hind parts while it is walking, standing, or eating, maintain very nearly their natural position—a little higher if any thing. It sometimes gets on its knees and eats, without however, touching any other part of its body to the ground. While I was observing it, it leaped over a stick without any difficulty, and lit on its feet. The animal is in good condition, and likely to live as long as any of the flock.

JOS. C. G. KENNEDY.

From the Farmers' Register.

THE "WATERLOO CÆSAREAN EVERGREEN CABBAGE"—ALIAS COW CABBAGE OF JERSEY.

The Farmer and Gardener of September 18, introduces an account of this cabbage (taken from the last No. of the Horticultural Register of Boston,) in the following manner:

"We have a few hundred of these plants growing at our little establishment; but as the season has been inauspicious, and they have not had a fair chance for luxuriant growth, we cannot say what may be the result of our experiment. We obtained the seed of Robert Sinclair, jr. at $5 a pound; those in England are, or were, held at $5 for 20 seed. The next season we shall take time by the forelock, and give the article a more fair and perfect trial. If it should prove by proper test to realize a moiety of what has been said of it, it will certainly produce a new era in agricultural pursuits; but as the venders of the seed of new things are not always the most scrupulous in pronouncing their eulogies on their virtues, time and actual cultivation are necessary in order that their capacities may be properly demonstrated.

In the more southern portions of our country, if this cabbage should prove as valuable as some of its encomiasts have stated it to be, it will, indeed, be a blessing. But of its properties after we have had time to form a correct practical opinion, we shall speak more fully."

Though the exaggerations of the English account given in the Horticultural Register, are partly neutralized by the remarks of its conductor, still there is some danger that there may spring up and spread over our land a *cow cabbage mania*, such as at different times has been excited by miller, Cobbett's Russian turnips, and Gama Grass. For this reason, as well as for the amusement of our readers, we republish (from the August No. of Loudon's Gardener's Magazine,) this most impudent puff, and shameless yet very successful deception. The nostrums recommended by agricultural quacks and patent venders, like those of the medical quacks, are generally the more successful in proportion to the enormity of the pretension and falsehood.

"An individual in England having shown a specimen of this variety of what is properly a borecole, to Mr. Coke of Holkham, that gentleman expressed surprise at its size, &c. Advantage was taken of this to puff off, as the phrase is, this vegetable under a new name; viz. the Waterloo Cæsarean evergreen cow cabbage, and sell the seeds at the rate of a sovereign for a packet containing twenty seeds. The following is an extract from the advertisement:

'Patronised by His Majesty. Wonderful production of nature! Waterloo Cæsarean evergreen cow cabbage, of recent discovery, unequalled in affording the most interesting and desirable results to the farmer, grazier, and manufacturer. This singular and extraordinary species of cabbage, almost unknown in England till introduced by the persevering efforts of Mr. Fullard, three years since, grows from nine to twelve feet high, and from fifteen to twenty feet in circumference. Five of these stupendous cabbages, now raised to the greatest perfection in quality as well as size, have been repeatedly found, by proper management, an ample allowance of food for one hundred sheep, or ten cows per day; and the nutrition thence supplied by this delicious vegetable will (as experience has already abundantly demonstrated) speedily produce the most surprising improvement in the *growth* and *utility* of every description of cattle. As an evidence of the beneficial tendency of this cabbage, Mr. F. has the great pleasure and satisfaction of saying, that sheep fed upon it have been found to produce wool of the finest silken texture, twenty-five inches long; a circumstance which cannot fail immediately to claim the utmost attention and admiration: as such, the cultivator of these cabbages will not only realize pecuniary profit beyond any previous experience, but the manufacturer will also obtain a material superior to any heretofore produced by the most profitable speculation, the general and extensive demand for which must exceed all present calculation. The commerce of the country, as well as the interest and pleasure of the community at large, will likewise be greatly, if not incalculably, enhanced by the cultivation and use of this improved vegetable production. This Waterloo Cæsarean cow cabbage has been pronounced by the father of the agriculturists, whom, from his well known experience, we are all bound to believe, to be the greatest wonder that ever appeared in the vegetable kingdom: It was shown to that very highly esteemed and truly respectable gentleman, T. W. Coke, Esq., Holkham Hall, Norfolk, in October last, when he immediately said—'*Mr. Fullard, you told me, three years ago, agriculturists were only half way advanced in improvement: this cabbage makes me say I am bound to believe you. I do say it is the greatest wonder the earth ever produced.*' Mr. Coke subsequently introduced several *dukes* and other *noblemen*, to the number of nine, to view this great production, all of whom expressed their astonishment, and engaged a part of the seed for use this year (1836.) These cabbages, if designed for use in the winter season, can, for convenience, as well as advantage to the grower, be then removed from the fields, and will serve to make handsome serpentine walks in gardens; or they will form a most excellent avenue for winter across a field; or, by setting them singly, will make a ground, that has not a tree in it, a park for winter, and may be given to the stock in spring. To obviate skepticism, and to afford the highest satisfaction and confidence as to the perfect rectitude of the statements here given, agriculturists, graziers, and all who feel an interest in the species of produce, are respectfully requested to apply to Mr. ——, wholesale perfumer, No. ——, ——, London, who will, with pleasure, exhibit specimens of the cabbage, and also wool of sheep fed with this vegetable production. Mr. —— is the sole agent in London for the Waterloo Cæsarean cow cabbage seed. All purchasers of it are particularly desired to sow it at the proper season (which is in July,) as stated in the directions which accompany the parcels, price 20s. each. The plants of this seed, unlike other vegetable produce for cattle, *never fail*, either numerically or in quality. A part of this seed has been engaged by His Majesty and forwarded to Norfolk Farm, near Windsor, to be sown this season; and the production is already likewise patronized by most of the royal family. The Duke of Wellington, and the following gentlemen, are a few only who have selected the seed for cultivation this year:—the Right Hon —— Dymock, Champion of England; Robert Leeds, Esq., Surrey; Thomas Back Esq., Wellsbro'; Joseph Cowen, Esq., Blenburn; Sir William Folk, Norfolk; P Preston, Esq., Barrister, Lincoln's Inn —— Allington, Esq., Little Barford, near St Neots; Edward Lindsell, Esq., Broom, near Biggleswade; Henry Walker, Esq., Corn Exchange; R. Sutton, Esq., Royal Exchange; —— Jesse, Esq., Hampton Court; Henry Hills, Esq., Aldbury; Henry Handley, Esq., M. P., Lincolnshire; —— Perkins, Esq., proprietor of Islington Market; William Shield, Esq., Lincolnshire; Thomas Hudson, Esq., York; —— Hern, Esq., Bury St. Edmonds; —— Watkin, Esq., Windsor. It is desirable to remember, that these sweet vegetables, when boiled, are remarkably tender, and in flavor resemble asparagus. For the table, or culinary purposes, they will ever be highly appreciated. They grow in the form of a cone, and from the thickness of their foliage, and being evergreen, they will be found ornamental to a garden. The plants, after two months' growth, (say in September,) require to be set out at the distance of two yards and a half from each other. They will grow on soil of moderate richness; but their greatest perfection will require soil of good quality. At any subsequent period to their being thus transplanted, they may be removed to any other place where convenience or taste may suggest. All letters from the country, requiring a packet of seed to be forwarded, must (to be attended to) contain a sovereign, or an order for the payment in London; and it is requested the name and address, where it is to be sent, be legibly written. Caution:—Any packet sold at a less price than a sovereign, either in town or country, cannot be genuine. Observe, also, upon each packet the circular seal, with this inscription: '——, No. ——.' It is important to observe, that none of the genuine cow cabbage seed will be sold after the month of July, for sowing this year, (1836.)'

'*Further Particulars.*—In reference to the length of wool produced by sheep fed upon the new colossal vegetable, as described in this prospectus, the proprietor, Mr. Fullard, to prove the fact, has now a lamb-hog, one year old, to be *seen* at Mr. ——, No. ——, ——, where T. W. Coke, Esq., of Holkham Hall, paid a visit on Tuesday, the 14th instant; and, upon due examination of the said lamb-hog, he declared, in the presence of many witnesses, that he never before saw such a specimen of wool for *length* and *fine* quality. Mr. F. has already been awarded *nine* premiums, by the Agricultural Societies for the *superiority* of his sheep and other cattle.

'(Signed) ——, No. ——.'

"The noise made by Cobbett's Locust was nothing to this. We are informed, on what we consider undoubted authority, that from 30 to 40 sovereigns a day were taken at the perfumer's shop referred to, for several months. The London seedsmen are regularly supplied with similar cow cabbage seed from Jersey; which is sold by retail, by Mr. Carlwood, at 1s. per ounce; an ounce, as we are informed by Mr. Cormick, containing about 5000 seeds, which would, of course, produce the wholesale perfumer £250 in ready money. As several gentlemen have called upon, and written to us respecting this cabbage, as they did about the time the *Gardener's Magazine* commenced, respecting Cobbett's Locust (see *Arb. Brit.*, p. 616,) we have thought it worth while to state the above; adding, that, as we know that our advice was not taken in regard to the locust, we doubt if it has deterred those who applied to us from purchasing the Cæsarean cabbage. The truth seems to be, that there is a portion of mankind who have a love for the marvellous to such an extent, as to become a disease which will have its course. . . . . A correct estimate of the real merits of this cab-

bage, by Mr. Saunders, of Jersey, who supplies the London trade with their seeds was published in the *Gardener's Magazine* in 1829, (vol. v., p. 440 :) and it has also appeared in the *Encyclopædia of Agriculture*. 2d edit., p. 867 "

ON THE HABITS OF THE HESSIAN FLY.
From the Farmers' Register.

CAMBRIDGE, EASTERN SHORE, MD., August 8th, 1836.

By the late disastrous ravages of the "Hessian Fly" throughout the whole wheat growing district of the United States, and the false notions entertained and circulated of the habits of this insect, giving astonishing currency to the most futile, yet strongly vouched remedies, for many years published, and yet publishing to the credulous community, lately in the "Baltimore American," formerly in the "American Farmer," and also in the "Farmer's Register," vol. 1., p. 351, (in which latter I am happy to see in a note appended, you dissent from the hypothesis to which I particularly allude,) I am led to offer a few remarks in opposition to the "prevalent and deleterious doctrine"—"the erroneous principles on which it is founded," and the consequently "erroneous prescription of the much-extolled specific."

An apology cannot be required for discussing one of the most interesting questions that is, or ever has been, before the agricultural community—"a preventive for the ravages of the Hessian Fly."

It is not that I am enabled to settle this mooted point of vital importance that I make this communication, but it is in the hope of *approximating* the *truth* by the detection of error ; and it is thus, "*instar omnibus*," that man, with his finite capacity, must approach and investigate the mysterious modes and results of infinite wisdom. And for the small contribution I now offer to this point, if it meet your approbation, I ask the favor of a space of your "Farmers' Register," where zeal is sanctioned by example, and confidence promoted by liberality.

The author of the communication, lately in the "Baltimore American," signed "Maryland Agriculturist"—"others also to the same effect," remarks, "it" (the Hessian Fly) "is either generated in the grain of wheat, similar to the bug which infests the pea ; or, the insect, when in its winged state, deposites an egg on the surface of the grain, when in the ear ; and thus, when the wheat is sown and begins to vegitate, the egg vivifies, and the destructive worm is formed."

He adopts the latter opinion, and makes it the basis of his *remedy*.

His reasons for the opinion are, 1st. "That the insect releases itself by bursting the blade that covers it, when the head is forming, and assumes its winged state, and deposites its egg on the wheat when filling and coming to perfection."

2nd. "That with the aid of a microscope, the egg is discernible in the form of a glutinous matter."

Hence he deduces the remedy which he earnestly recommends to the notice of the farmer, viz : "to pass the seed, through brine or pickle, washing it well, and then roll it in lime."

By what means he does not inform us, he has arrived at the conclusion of this alternative, for the parental selection of a nidus ; nor why he rejects the possibility of some other part of the plant being the chosen spot.

Indeed, the hypothesis adopted by this gentleman, and for many years, by others, so ardently, and no doubt so honestly pressed upon the agricultural community, rests upon a concatenated string of errors in fact, "false principles" and "false conclusions," and will lead, if practiced, to infallible disappointment.

It is not a fact, "that this insect releases itself" by bursting the blade that covers it, when the *head* is *forming*, and then assumes the winged state' from which the writer infers the deposite of its eggs, when the *grain* is *filling*."

It is a fact, well known, I had supposed, to every wheat grower in the United States, who has noticed the habits of the Hessian Fly, that they have at least *two broods* in the year, the fall and the spring brood, and probably more ; the *two* are well known, because of their effects upon a valuable crop : others are not generally known.

The first of the two is *deposited* (or, I will say, "*appears*,") as every one knows, on the young autumnal wheat, where it rests at the base of the blade, till the vegetable juices have nourished it, and the solar beams have matured it, which, in general, does not occur, at least in the climate of Maryland, until between the first and tenth of the following "*May*," when they are seen on, on the wing, over the wheat fields, though in a momentary period, perpetrating their appalling deeds of mischief, by that almost incredible multiplication and celerity of performance, which all the smaller and ephemeral insects are capable of. Their progression then, from the egg to the "*larva*," the "*chrysalid*," and the parent, or winged state, is more or less rapid, as the weather is favorable.

I would ask those numerous and respectable *entomologists*, and *farmers*, who contend thta the *grain* is the medium through which the parent transmits the *new progeny* into life, "what becomes of those whose destinies have fixed their first stage upon a period when the *grain* is *not formed?* act. the "spring," or the "*May*" brood. Will they say that one brood adopts the *grain*, and another the *blade* for a nidus ? This contrariety of habit in the same insect is seen no where. It would be repugnant to the "known laws of nature," to "analogy," and to the "character of *instinct*," which is notoriously *immutable*. Will they unite with us in the apostrophe—"*Natura! quam te colimus inviti quoque.*"

From the difficulty of accommodating this "*May brood*," then, it would seem to be deducible, as a matter of necessity, "a they must be accommodated, and *a priori*" in a similar manner as the *fall brood* ; and there is then no *grain* accommodation for them, there being no *grain formed at that time* ; and yet they continue their procreation, "that the numerous and respectable entomologist, and farmers, who advocate the deposite *on* or *in* the *grain*, are "*quoad hoc*" in error ; and their remedy *consequently* and *absolutely* erroneous, and wholly inefficacious.

It is certain that the deposite must be made upon a part of the plant already *substantial*, *visible*, and *tangible* at the time, but the "*May*" deposite finds no grain in this condition ; and the dogma, "that it *must* be *on* or *in* the grain, *must* be abandoned as wholly untenable ; and some other part of the plant must be sought as the selected spot of the deposite. I will presently show that this part is the blade.

2nd. The writer says, "if I had any doubts on this subject, they would be removed by the fact, that with the aid of a microscope the egg is discernible in the form of a glutinous matter."

What egg ? I would ask. He has not attempted to show or to make it probable that the egg of the Hessian Fly has ever been seen on the grain of wheat, or on any other grain. If it can be shown that the grain was *ever* its resort, then it will be conceded, that it *always was* and *always will* be its resort ; if the blade, the same : *reason* may be variable, but *instinct* never changes—the "*curculio*" will take his *fruit*, the "*aphis*" his *leaf*—they will perish rather than violate the laws of their nature, their physical and innate character. The eggs seen may have been the eggs of other insects. I have for some years observed a small, gaunt blue fly, very similar to the house fly, but much smaller, operating upon the head of wheat when nearly ripe, and apparently depositing eggs. I have found upon these heads, afterwards examined, and within the capsule, small larvæ which had consumed a portion of the grain. These are, possibly, from the fly the northern States are complaining of ; and the eggs the gentleman has seen on the grain may have proceeded from the same source.—They have never appeared here in sufficient numbers to excite alarm, and they certainly are not the product of the Hessian Fly. Having already shown that the head, or grain of the wheat cannot possibly be the place of deposite for the Hessian Fly, I will proceed to verify my promise in a manner which I hope will be satisfactory to make it conclusively certain, that the blade of the plant is the place of deposite for the egg I shall annex the authority, because thereby a responsibility is offered ; and consequently an additional sanction given to the verity of the facts. This is the more necessary, because of the importance of all facts, regarding this important subject matter ; and especially such as may preserve the farmer from a fallacious confidence in a proposed remedy, which must inevitably disappoint his hopes, lull him into false security, and possibly suspend his further inquiries into a subject, whose vital importance requires incessant and united prosecution.

On the seventh day of "*May*" last, (a warm day, so noted on my agricultural diary,) I observed in an outer corner of one of my wheat fields, a cloud of insects, on

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This Waterloo Cæsarean cow cabbage has been pronounced by the father of the agriculturists, whom, from his well known experience, we are all bound to believe, to be the greatest wonder that ever appeared in the vegetable kingdom. It was shown to that very highly esteemed and truly respectable gentleman, T. W. Coke, Esq., Holkham Hall, Norfolk, in October last, when he immediately said—'*Mr. Fullard, you told me, three years ago, agriculturists were only half way advanced in improvement: this cabbage makes me say I am bound to believe you. I do say it is the greatest wonder the earth ever produced.*' Mr. Coke subsequently introduced several *dukes* and other *noblemen*, to the number of nine, to view this great production, all of whom expressed their astonishment, and engaged a part of the seed for use this year (1836.) These cabbages, if designed for use in the winter season, can, for convenience, as well as advantage to the grower, be then removed from the fields, and will serve to make handsome serpentine walks in gardens; or they will form a most excellent avenue for winter across a field; or, by setting them singly, will make a ground, that has not a tree in it, a park for winter, and may be given to the stock in spring. To obviate skepticism, and to afford the highest satisfaction and confidence as to the perfect rectitude of the statements here given, agriculturists, graziers, and all who feel an interest in the species of produce, are respectfully requested to apply to Mr. ——, wholesale perfumer, No. ——, ——, London, who will, with pleasure, exhibit specimens of the cabbage, and also wool of sheep fed with this vegetable production. Mr. —— is the sole agent in London for the Waterloo Cæsarean cow cabbage seed. All purchasers of it are particularly desired to sow it at the proper season (which is in July,) as stated in the directions which accompany the parcels, price 20s. each. The plants of this seed, unlike other vegetable produce for cattle, *never fail*, either numerically or in quality. A part of this seed has been engaged by His Majesty and forwarded to Norfolk Farm, near Windsor, to be sown this season; and the production is already likewise patronized by most of the royal family. The Duke of Wellington, and the following gentlemen, are a few only who have selected the seed for cultivation this year:—the Right Hon —— Dymock, Champion of England; Robert Leeds, Esq., Surrey; Thomas Back Esq., Wellsbro'; Joseph Cowen, Esq, Blenburn; Sir William Folk, Norfolk; P Preston, Esq., Barrister, Lincoln's Inn —— Allington, Esq., Little Barford, near St Neots; Edward Lindsell, Esq., Broon, near Biggleswade; Henry Walker, Esq., Corn Exchange; R. Sutton, Esq., Royal Exchange; —— Jesse, Esq., Hampton Court; Henry Hills, Esq., Alnebury; Henry Handley, Esq., M. P., Lincolnshire; —— Perkins, Esq., proprietor of Islington Market; William Shield, Esq., Lincolnshire; Thomas Hudson, Esq., York; —— Hern, Esq., Bury St. Edmonds; —— Watkin, Esq., Windsor. It is desirable to remember, that these sweet vegetables, when boiled, are remarkably tender, and in flavor resemble asparagus. For the table, or culinary purposes, they will ever be highly appreciated. They grow in the form of a cone, and from the thickness of their foliage, and being evergreen, they will be found ornamental to a garden. The plants, after two months' growth, (say in September,) require to be set out at the distance of two yards and a half from each other. They will grow on soil of moderate richness; but their greatest perfection will require soil of good quality. At any subsequent period to their being thus transplanted, they may be removed to any other place where convenience or taste may suggest. All letters from the country, requiring a packet of seed to be forwarded, must (to be attended to) contain a sovereign, or an order for the payment in London; and it is requested the name and address, where it is to be sent, be legibly written. Caution:—Any packet sold at a less price than a sovereign, either in town or country, cannot be genuine. Observe, also, upon each packet the circular seal, with this inscription: '——, No. ——.' It is important to observe, that none of the genuine cow cabbage seed will be sold after the month of July, for sowing this year, (1836.')

'*Further Particulars.*—In reference to the length of wool produced by sheep fed upon the new colossal vegetable, as described in this prospectus, the proprietor, Mr. Fullard, to prove the fact, has now a lamb-hog, one year old, to be *seen* at Mr. ——, No. ——, ——, where T. W. Coke, Esq., of Holkham Hall, paid a visit on Tuesday, the 14th instant; and, upon due examination of the said lamb-hog, he declared, in the presence of many witnesses, that he never before saw such a specimen of wool for *length* and *fine* quality. Mr. F. has already been awarded *nine* premiums, by the Agricultural Societies for the *superiority* of his sheep and other cattle.

'(Signed) ——, No. ——.'

"The noise made by Cobbett's Locust was nothing to this. We are informed, on what we consider undoubted authority, that from 30 to 40 sovereigns a day were taken at the perfumer's shop referred to, for several months. The London seedsmen are regularly supplied with similar cow cabbage seed from Jersey; which is sold by retail, by Mr. Carlwood, at 1s. per ounce; an ounce, as we are informed by Mr. Cormick, containing about 5000 seeds, which would, of course, produce the wholesale perfumer £250 in ready money. As several gentlemen have called upon, and written to us respecting this cabbage, as they did about the time the *Gardener's Magazine* commenced, respecting Cobbett's Locust (see *Arb. Brit.*, p. 616,) we have thought it worth while to state the above; adding, that, as we know that our advice was not taken in regard to the locust, we doubt if it has deterred those who applied to us from purchasing the Cæsarean cabbage. The truth seems to be, that there is a portion of mankind who have a love for the marvellous to such an extent, as to become a disease which will have its course. A correct estimate of the real merits of this cab-

bage, by Mr. Saunders, of Jersey, who supplies the London trade with their seeds was published in the *Gardener's Magazine* in 1829, (vol. v., p. 440;) and it has also appeared in the *Encyclopædia of Agriculture*. 2d edit., p. 867."

ON THE HABITS OF THE HESSIAN FLY.
From the Farmers' Register.

CAMBRIDGE, EASTERN SHORE, MD., August 8th, 1836.

By the late disastrous ravages of the "Hessian Fly" throughout the whole wheat growing district of the United States, and the false notions entertained and circulated of the habits of this insect, giving astonishing currency to the most futile, yet strongly vouched remedies, for many years published, and yet publishing to the credulous community, lately in the "Baltimore American," formerly in the "American Farmer," and also in the "Farmer's Register," vol. 1., p. 351, (in which latter I am happy to see in a note appended, you dissent from the hypothesis to which I particularly allude,) I am led to offer a few remarks in opposition to the "prevalent and deleterious doctrine"—"the erroneous principles on which it is founded," and the consequently "erroneous prescription of the much-extolled specific."

An apology cannot be required for discussing one of the most interesting questions that is, or ever has been, before the agricultural community—"a preventive for the ravages of the Hessian Fly."

It is not that I am enabled to settle this mooted point of vital importance that I make this communication, but it is in the hope of *approximating* the *truth* by the detection of error; and it is thus, "*instar omnibus*," that man, with his finite capacity, must approach and investigate the mysterious modes and results of infinite wisdom. And for the small contribution I now offer to this point, if it meet your approbation, I ask the favor of a space of your "Farmers' Register," where zeal is sanctioned by example, and confidence promoted by liberality.

The author of the communication, lately in the "Baltimore American," signed "Maryland Agriculturist"—"others also to the same effect," remarks, "it" (the Hessian Fly) "is either generated in the grain of wheat, similar to the bug which infests the pea; or, the insect, when in its winged state, deposites an egg on the surface of the grain, when in the ear; and thus, when the wheat is sown and begins to vegitate, the egg vivifies, and the destructive worm is formed."

He adopts the latter opinion, and makes it the basis of his *remedy*.

His reasons for the opinion are, 1st. "That the insect releases itself by bursting the blade that covers it, when the head is forming, and assumes its winged state, and deposites its egg on the wheat when filling and coming to perfection."

2nd. "That with the aid of a microscope, the egg is discernible in the form of a glutinous matter."

Hence he deduces the remedy which he earnestly recommends to the notice of the farmer, viz: "to pass the seed, through brine or pickle, washing it well, and then roll it in lime."

By what means he does not inform us, he has arrived at the conclusion of this alternative, for the parental selection of a nidus; nor why he rejects the possibility of some other part of the plant being the chosen spot.

Indeed, the hypothesis adopted by this gentleman, and for many years, by others, so ardently, and no doubt so honestly pressed upon the agricultural community, rests upon a concatenated string of errors in fact, "false principles" and "false conclusions," and will lead, if practiced, to infallible disappointment.

It is not a fact, "that this insect releases itself" by bursting the blade that covers it, when the *head* is *forming*, and then assumes the winged state' from which the writer infers the deposite of its eggs, when the *grain* is *filling*."

It is a fact, well known, I had supposed, to every wheat grower in the United States, who has noticed the habits of the Hessian Fly, that they have at least *two broods* in the year, the fall and the spring brood, and probably more; the *two* are well known, because of their effects upon a valuable crop: others are not generally known.

The first of the two is *deposited* (or, I will say, "*appears*,") as every one knows, on the young autumnal wheat, where it rests at the base of the blade, till the vegetable juices have nourished it, and the solar beams have matured it, which, in general, does not occur, at least in the climate of Maryland, until between the first and tenth of the following "*May*," when they are seen on, on the wing, over the wheat fields, though in a momentary period, perpetrating their appalling deeds of mischief, by that almost incredible multiplication and celerity of performance, which all the smaller and ephemeral insects are capable of. Their progression then, from the egg to the "*larva*," the "*chrysalid*," and the parent, or winged state, is more or less rapid, as the weather is favorable.

I would ask those numerous and respectable *entomologists*, and *farmers*, who contend that the *grain* is the medium through which the parent transmits the *new progeny* into life, "what becomes of those whose destinies have fixed their first stage upon a period when the *grain* is *not formed?* ect. the "spring," or the "*May*" brood. Will they say that one brood adopts the *grain*, and another the *blade* for a nidus? This contrariety of habit in the same insect is seen no where. It would be repugnant to the "known laws of nature," to "analogy," and to the "character of *instinct*," which is notoriously *immutable*. Will they unite with us in the apostrophe—"*Natura! quam te colimus inviti quoque.*"

From the difficulty of accommodating this "*May brood*," then, it would seem to be deducible, as a matter of necessity, "a they must be accommodated, and *a priori*" in a similar manner as the *fall brood*; and there is then no *grain* accommodation for them, there being no *grain formed at that time*; and yet they continue their procreation, "that the numerous and respectable entomologist, and farmers, who advocate the deposite *on* or *in* the *grain*, are "*quoad hoc*" in error; and their remedy *consequently* and *absolutely* erroneous, and wholly inefficacious.

It is certain that the deposite must be made upon a part of the plant already *substantial*, *visible*, and *tangible* at the time, but the "*May*" deposite finds no grain in this condition; and the dogma, "that it *must* be *on* or *in* the grain, *must* be abandoned as wholly untenable; and some other part of the plant must be sought as the selected spot of the deposite. I will presently show that this part is the blade.

2nd. The writer says, "if I had any doubts on this subject, they would be removed by the fact, that with the aid of a microscope the egg is discernible in the form of a glutinous matter."

What egg? I would ask. He has not attempted to show or to make it probable that the egg of the Hessian Fly has ever been seen on the grain of wheat, or on any other grain. If it can be shown that the grain was *ever* its resort, then it will be conceded, that it *always was* and *always will* be its resort; if the blade, the same: *reason* may be variable, but *instinct* never changes—the "*curculio*" will take his *fruit*, the "*aphis*" his *leaf*—they will perish rather than violate the laws of their nature, their physical and innate character. The eggs seen may have been the eggs of other insects. I have for some years observed a small, gaunt blue fly, very similar to the house fly, but much smaller, operating upon the head of wheat when nearly ripe, and apparently depositing eggs. I have found upon these heads, afterwards examined, and within the capsule, small larvæ which had consumed a portion of the grain. These are, possibly, from the fly the northern States are complaining of; and the eggs the gentleman has seen on the grain may have proceeded from the same source.—They have never appeared here in sufficient numbers to excite alarm, and they certainly are not the product of the Hessian Fly. Having already shown that the head, or grain of the wheat cannot possibly be the place of deposite for the Hessian Fly, I will proceed to verify my promise in a manner which I hope will be satisfactory to make it conclusively certain, that the blade of the plant is the place of deposite for the egg. I shall annex the authority, because thereby a responsibility is offered; and consequently an additional sanction given to the verity of the facts. This is the more necessary, because of the importance of all facts, regarding this important subject matter; and especially such as may preserve the farmer from a fallacious confidence in a proposed remedy, which must inevitably disappoint his hopes, lull him into false security, and possibly suspend his further inquiries into a subject, whose vital importance requires incessant and united prosecution.

On the seventh day of "*May*" last, (a warm day, so noted on my agricultural diary,) I observed in an outer corner of one of my wheat fields, a cloud of insects, on

the wing, swarming like bees, over a space of a few acres of the young wheat. Attracted by their dense and glittering appearance, increased, no doubt, by the bright solar rays reflected from them, I rode up to the swarm, whose elevation reached from the ground to about fifteen feet. I caught several, and found them to be the Hessian Fly. On that day week, (also a warm and bright day, the intervening days had been generally, cool,) I took a microscope to the field, and pulling up several bunches of the wheat within the sphere of their flight, I discovered on many of the blades of *every* bunch, ane on their upper surface, and a few inches from their insertion into the stem, agglutinated eggs, and larvæ invisible to the naked eye until the point was indicated by the instrument, when they might be seen in different stages of forwardness or progression to maturity: some *white*, in which no insect would be discerned upon breaking them, some *yellow*, in which insects were found, and others, from which they were recently released, and lying at the mouth of the shell, yet motionless, apparently, and with their heads turned downwards, as if to make their way as soon as they could move to the base of the blade, at which, finally, the too visible fattened, and grown larvæ, and chrysalid, give woful evidences of the source of their life and nutrition, and of the decline and death of the great object of our care and attention.

Having made these observations, I extended my researches through the apparent sphere of their operations, and found it infested: these few acres became entirely naked; and it is remarkable that no other part of the field afforded any vestige, *then* or *afterwards*, of the fly. Upon the remainder, I grew a heavy crop of straw—the grain was destroyed by the general, and subsequently ci a trous scab. Many of the chrysalids I have brought to maturity, leaving no doubt of the identity of parent and offspring.

From the whole premises—"from facts"—"from reason"—from "analogy" it is clear, that the leaf of the plant, and not the head or grain is the *fit* and *actual* nidus of the Hessian Fly—it is *there* that it is deposited, hatched and matured; and probably in several successive generations from the first suitable stage of the autumnal wheat, until, by its growth it is rendered too coarse for the functions of the tender offspring, when, no doubt, they renew their deposites, perhaps sparsely, on other tender plants, their next preferences, till their favorite growth of the coming autumn, shall complete the cycle.

The general character of the instinctive faculty, in other, insects better known, for the preservation of their broods, under the influence of which, they seek a nidus, in or near which, their progeny, when hatched, may be nourished—the fact, never I believe denied, that the larvæ of this fly has always been found at or near the base of the *leaf*, and never *on* or *in* the *grain*, or the *head*—the fact, that the grain or head does not exist at the time of the "*May*" deposite—the fact, that the larvæ of this fly does not consume any part of the grain or head, nor leave any trace of even a transcient existence in that portion of the plant—the fact, that if the egg were deposited there, the grain, when thrashed, under going its necessary heat, would, "as with the moth" or wheat weevil, vivify its *incumbent*, occupying so delicate a shell, which is alleged by these theorists to be afterwards brought to life by a *less degree* of *heat*, in the earth, after the cool season of seed time—the fact, that if deposited and hatched *on* or *in* the grain, it must in its tender larvæ stage feed *there* or perish, and the fact, that it does not feed *there* and does not perish; all these facts undeniable, together with those stated, as coming under my late observation, can leave no reasonable doubt, that the place of deposite for the egg of the Hessian Fly, is the *leaf*—and *not* the *grain* or *head*, and demonstrate the absolute futility of the brining and liming remedy, so confidently and earnestly relied on, and recommended for many years; and to the present moment reiterated with ejaculations of surprise, "that so simple and infallible a remedy, (see Farmers' Register, vol. I.,) should not be generally circulated and adopted for the good of mankind."

Finally, I may remark, that I used this process of brining and liming for three years, not for the "fly," but for the smut, (*le charbon*,) a stinking, contagious pest, very different from the black head, (*la nielle*,) which latter is, with us, generally and improperly called smut: of the former, we have had but little: yet, for a few years, by some unknown cause, it was introduced among my wheat. I found this remedy unavailing also for this disease; and my crops were not relieved until I purchased a new stock of seed wheat and scoured my granaries. In one of these years, it happened, that my crops, thus treated, suffered as much, perhaps more, than any previous season: and from these experiments, (which were fully and faithfully executed, and on a large scale, because I entertained sanguine hopes of success,) I am under the fullest conviction, that the germinative principles is enfeebled by the process, and the plant rendered thereby an easier prey to the fly, or any other invading insect.*

I have, my dear sir, far exceeded the limits of my design in this communication; but really, the question of a remedy for the Hessian Fly is so interesting—the detection of a prevalent error in respect to it so essential to its true solution—the chief remedy offered is so confidently pressed upon the public, and so palpably worse than nothing, inasmuch as it holds out false views, and obscures the path of research, coming too under the sanction of many and highly respectable sources, from New-York to Virginia, inclusive—these considerations make my apology for the zeal which I have evinced, and the freedom which has been taken, by

Yours respectfully,
JOSEPH E. MUSE.

* From our experience of brining and liming seed wheat, to prevent the smut, we have arrived at different opinion from Dr. Muse—as we have never known that disease to occur after the preventive process had been "fully and faithfully executed." Still we admit that such negative proofs, are not conclusive, as possibly some unknown causes may have checked or prevented the disease. In another opinion expressed above, we are much disposed to concur—that is, that the process of brining and liming, (at least as usually, and perhaps carelessly, executed,) serves to weaken the germinating power of the seed, and thereby enfeebles the plants. ED. FAR. REG.

From the Portland Advertiser.

COTTON MANUFACTURES.

If the manufacture of cotton is a profitable business, and that it is so, we think those who have attended to facts and have read our former numbers cannot doubt; we believe it to be equally clear, that it can in no part of the United State be conducted with a prospect of more favorable results than in Maine. That locality has something to do with the result must be obvious to the most casual observer, and we have briefly adverted to some of the grounds of it on a former occasion. We have recently fallen in with some calculations on this subject which set the matter in a still clearer light. In a recent number of Blackwood's Magazine a writer has made a comparison between the expenses of spinning in England and France, by which it appears that the cost of spinning half a kilogramme of cotton which is 17½ ounces, into yarn No. 30 to 40 in Manchester, exclusive of the raw material, is 13 cents, while at Mulhausen a considerable manufacturing town in France, it is 20 cents. This expense is made up of wages, fuel, interest of capital, wear and tear, charges of freight, &c., steam being the moving power. In Zurich the principal manufacturing town in Switzerland where the moving power is *water*, the expense is less than it is in England, although in the latter country the interest and general charges are much lower than in France or Switzerland. In 1834, M. Kaechlin a large manufacturer and member of the French Chamber of Deputies, estimated the cost of spinning No. 30 to 35 yarn at 14 cents a kilogramme at Mulhausen, of which fuel, comprising lighting, constituted rather more than one seventh; while at Zurich where the machinery is moved by water, that important item wholly saved, as admitted by the same distinguished operator. It is evident however, that in his calculation he was looking only to the moving power, for in every establishment, fuel for heating is a necessary charge.

In this country although wages and interest upon the capital are higher than in England or France, yet the cheapness of our water power and the much lower price of subsistence, taxes, and of the raw material, nearly equalizes the general expense, and enables us, especially in coarser goods, to undersell the foreign manufacturer. A writer in the American Encyclopedia, after enumerating the advantages possessed by this country says, "it would seem not improbable that this country will be the future source of supply, in coarse cottons for foreign markets."

But still notwithstanding the great advantages of manufacturing in our own country, and notwithstanding the encouragement held out by a protective tariff, the manufacture of cotton is carried on to a vastly greater extent both in France and England than with us.

In England in 1834, the number of spin-

dles were 9,333,000, in France 3½ millions, while in the United States there were but 1¾ millions. And in the same year there were *imported into this country* cot on goods from England to the value of $8,200,000, from France $1,100,000 and from Germany $300,000, making a total of $9,600,000. This large sum expended among ourselves instead of being sent out of the country, might have given employment to a vast number of persons and been the source of wealth to many more. The fact also proves that there is abundant room for the profitable employment of a greater amount of capital in this important branch of business; for with our high protective duty, if the foreign manufacturer can afford to send his fabrics to this market, we, saving the duty both upon the raw material and upon the cloths, can certainly safely increase the quantity of our manufactures and afford to undersell him in our own markets. Besides these advantages our *exports* of cotton fabrics have been gradually increasing from 1825 when they amounted to but little over one million of dollars, until the present time.

In 1833 the exports amounted to $2,321,000, of which $1,900,000 were to South America and Mexico, $120,000 to India and Africa, $215,000 to China, and $86,000 to the West Indies. Now with all the advantages of our country for manufacturing, with the opening of these and other markets for our goods, with the increasing use and demand in our own country and abroad, and the increasing popularity of American manufactures, can any doubt remain about the st b lity and the profit of cotton manufactures in the United States, and especially in New-England. Let it be remembered that we have confined ourselves principally to the ma ufacture of *coarse goods*, but as the business advances, the higher and more valua ble qualit es of fabrics will become the subject of attention, by which new employment will be given to skill and inge nuity, and new markets opened to the manufactures of our enterprising and i defatigable countrymen. The same causes which have built up the cities of Liverpool and Manchester in England, of Glasgow and Paisley in Scotland, and give e ployment to a million and more of persons in those countries, are now in operation among us, and under the fostering protection of our free i stitutions, the security of property, an energetic spirit, and inc easing skill and improvements, are destined to diffuse wealth and prosperity widely over our land. The following progress of a pound of cotton, extracted from the English Monthly Magazine, will not be uninteresting. "There was sent to London lately from Paisley, a small piece of *Muslin*, about *one pound weight*, the history of which is as follows. The wool came from the East I ies to London; from London it went to Lancashire, where it was manufactured into yarn; from Manchester it was sent to Paisley, where it was woven; it was sent to Ayrshire next, where it was tamboured; it was then conveyed to Dumbarton, where it was hand-sewed and again retured to Paisley, whence it was sent to Glasgow and finished, and then sent per coach to London. It may be reckoned about three years that it took to bring this article to market, from the time when it was packed in India, till a arrived complete in the merchant's warehouse in London: whither it must have been conveyed 5000 miles by sea, nearly 1000 by land, and have contributed to reward the labor of nearly 150 persons, whose services were necessary to the carriage and manufacture of this small quantity of cotton, and by which the value has been advanced more than 2000 per cent."

MANUFACTURE OF BEET-ROOT SUGAR IN RUSSIA.

Sir,—The manufacture of beet-root into sugar in the Russian empire has of late become very extensive; there are already no less than twenty-five large establishments for this purpose in different parts. Thinking that the following account of one of the principal of these establishments, viz. Micharlofsky Sugar-works in the government of Tula, the property of Count Bobrinsky, may be interesting to the English public, I send it for insertion in your widely circulated Journal:—

The quantity of beet worked in the year 1835 was 260,000 poods=to 85,357 cwt. 0 qr. 16 lbs.; the sugar produced from it, 15,600 poods=5014 cwt. 1 qr. 4 lbs.

Price of a pood of beet	15 cop cks.
Expense in working do.	35 do.
	50

Produce of one pood of beet 2⅔ lbs., of raw sugar at 1 ro. 10 co. per lb.

The number of men employed 250.

The quantity of land required to produce the beet 350 deciatines=945 acres.

The beet is generally taken from the peasentry instead of the obrok or fine they, as serfs, would have to pay their baron.

The proprietor of this manufactery is an accomplished and amiable nobleman; his experiment in this case has been highly successful.

One great evil is the impossibility hitherto experienced of keeping the roots any length of time, which makes it expedient they should be worked as soon as possible after they are taken from the ground.

I have been favored with a specimen of raw and refined sugar from these works, of which I send you a small sample, and am only sorry the distance does not allow me to send a larger one.

The Russian lb. is equal to 14¼ oz. English; a pood 40 lbs. Russia=36 lbs. English; a rouble=100 copecks; sterling value 10½d.]

Your constant reader,
J. K.

Petersburg, June, 25, 1836.

[The samples sent are excellent; the raw sugar not quite so good as that from the cane, but the refined qual to the best products of our refineries Ed. M. M.]

FACTS AND OBSERVATIONS.

The following is from an old number o the Memoirs of the Massachusetts Agricultural Society:

The attention necessary to be paid to raising and feeding silk worms, would form an agreeable and lucrative employment t those who are placed above manual services There is no part of *America* wherein the silk worm cannot be supplied with proper feed: as mulberry trees will thrive with very little care, even in the coldest. We are informed that in 1789, no less than 5400 pounds of silk were raised in the cold and sandy territory of *Prussia*. Perhaps no country possesses greater advantages for this purpose than *America*; and should this manufacture ever be actively pursued, it will not be extravagant to expect silken stuffs as cheap as any cloth made in America.

To show with what ease and convenience the worm may be fed, the following directions are extracted from some sensible letters, written by Mr. Joseph Clarke, of Northampton, and communicated by the Hon. James Winthrop, Esq., of Cambridge. To these gentlemen, the Society return their thanks, and will be obliged by any further communications to improve the agriculture and manufactures of our country.

Extracts from Mr. Clarke's Letters.

About ten years ago, I set over an acre of land with small mulberry trees, ten feet apart; they flourished extremely well, and in three or four years they formed a perfect forest. From these I used to gather my leaves; but I soon found the trouble and expense was too great; for I was obliged in the latter part of feeding, to employ a great many people, or the worm must starve; having observed those trees which were accidentally broken down sprouted anew and luxuriantly the following year, determined me on another method. I had a small enclosure of very rich ground, about six rods square, which in the spring of the year 1793 I ploughed and manured well. Here I sowed my mulberry seeds in rows, like carrots or parsnips in a garden, at suitable distances from each other for weeding and hoeing between them. The seed came up well, and the plants were kept quite free from weeds that summer; in doing which, you must be very careful as the plants are exceeding tender; in this first weeding the fingers must be principally used. The next spring before they began to sprout, with a scythe, I cut down all the bushes within two inches of the ground, and carefully weed them. This method answered my most sanguine expectations; for by the middle of July, when the worms devour the most leaves, they had grown up three feet in height, and being cut with a sickle, furnished me with abundance of leaves, in a cheap, easy and expeditious manner. The same method has been pursued with these trees or bushes ever since; so that you see there is no necessity for sowing the seed annually. A field once sown, will, for aught I can see, last a thousand years, if it be well taken care of. My mulberry trees are more flourishing this year, and yielded more food for the worms than they ever did before. This I attribute chiefly to the manure I put on them the last spring; notwithstanding they were cut down last July, they are now (October) about three feet high. My worms were hatched out the 24th of June, and continued eating just four weeks. They have consumed upwards of three thousand pounds of leaves, and the trouble of gathering them has been but little, compared with the whole business. A man can reap 3 or 400 weight within an hour; the expense and trouble are therefore trifling. I perform about three quarters of the business myself. The quantity of silk produced is about ten pounds: as to the quality, I can in no way so well inform you as by sending a skein of sewing silk,* which I pray you to accept.

The idea that water is injurious to silk worms, is totally unfounded. My worms this year have been chiefly fed on wet leaves, gathered early in the morning, and as they grow dry in the course of the day,

* This silk will bear a comparison with the best imported silk.

† This candid statement destroys the idea of water being injurious to the silk worm, an opinion that has been long established and is still maintained in some late publications. To remove all doubt, (if any can possibly remain) the following mode is added, which will not only confirm Mr. Clark's assertion, but teach

were sprinkled with water.† I have used in one day three pails full, in sprinkling the leaves, for I think it invigorates the worm in sultry weather. Hot water for the purpose of killing the chrysalis that is within the cocoon, to prevent its making his way through, and spoiling the silk, is never used. Hot water is only used when the cocoons are wound off into skeins. To kill the chrysalis, the cocoons are put into an oven, about as warm as when a woman takes out her bread; or they are exposed one or two days to the fierce rays of the sun. The last method is best, as there is no danger of injuring the silk, as may be the case in the former way. Should the oven be a little too warm, spread your cocoons on a table in the sun for two days successively; if you suspect they are not effectually killed, let them be out another day. They must be carried in at night; they must not be wet; if you wish to know whether the chrysalis be dead, take one of the thickest of the cocoons and cut it open; if you cannot perceive any life, you may conclude they are sunned sufficiently; should you perceive any signs of life, sun them another day.

From the Farmers' Register.

A LONDON AUCTIONEER'S ADVERTISEMENT OF LANDS IN VIRGINIA.

[The following puff extraordinary, (taken from a late English paper,) furnishes another evidence of the system of fraud which is continued to be practised in England, in the sale of mountain land in Virginia. As in a previous volume we commented at some length on these fraudulent sales, and as it would be to as little purpose again to endeavor to warn the dupes, we shall merely insert this advertisement, to amuse our readers in general, and to astonish those who may reside near the locality described, with the exalted character which their lands have acquired across the Atlantic.]

In the State of Virginia—A most important Estate for those of moderate means, and who would emigrate successfully.—Mr. George Robins is instructed to offer to public competition, at the auction mart, London, on Tuesday, the 9th of August, at twelve, in lots of 1000 and 2000 acres each. The Freehold Lands included in this important sale, extend to one hundred thousand acres, situate on the mighty waters of the great Ohio, in the Commonwealth of Virginia—the neighborhood of rising towns, good markets, navigable rivers, and national turnpike roads. There is a direct communication by steam to New-York, Orleans, Pittsburgh, Richmond, Baltimore, and Washington. Three vast railroads have commenced, under the sanction of government, who have contributed fifteen millions of dollars towards the completion. In three short years they will be perfected. The lands are in the counties of Cabell, Harrison and Giles. They are fertile (almost beyond belief,) the soil adapted to the production of every thing that is useful. Industry and a little capital are alone wanting to render this one of the fairest agricultural portions of the globe, and in a climate, it must be remembered, remarkable for its salubrity and invigorating powers: besides which it may be called the land of promise, inasmuch as the mineral and fossil wealth is nowhere to be equalled, and iron, coal, lead, and salt are found in all directions in the greatest abundance. From the minerals on this property a source of commercial enterprize may be contemplated. It should be observed, in conclusion, that religious worship is unshackled, and there is a total absence of taxes. It may therefore be stated in great confidence, that this sale will secure to those of very limited means, wealth without risk; possessing the only essential requisites of industry and talent. A farmer having saved £100 or £200 from the wreck of his fortune here, will find at this sale, the opportunity to realize all his bright and early anticipations. It is not a speculation founded on theory—experience has demonstrated that it is a moral certainty; and consequently, a mechanic possessing £200 and upwards may confidently appear at this auspicious sale.

Particulars may be had at the Waterloo, Liverpool; the Manchester Times office, at Manchaster; the Hen and Chickens, at Birmingham; the Auction Mart; and at Mr. George Robins' office, in Covent Garden. The title is clear beyond the possibility of doubt.

From "London's Gardeners' Magazine."

A FEW FACTS ILLUSTRATIVE OF THE CAUSE OF CANKER, AND OTHER DISEASES, IN FRUIT TREES. BY MR. T. RIVERS, JUN.

A few facts in the culture of fruit trees have caught my notice, which may perhaps serve in some way to elucidate the cause of canker and disease in those useful occupants of our gardens. The green chisel pear tree, in our soils, is particularly subject to canker, every shoot dying half way down, the season after being produced; this taking place alike in wet and dry, warm and cold, seasons, and, consequently, the trees, in the course of a few years, getting to be a confused mass of cankered and dead branches, full of moss and disease. Latterly, I have observed all these diseased trees attacked by a grub, which has perforated the stem in every direction, making channels large enough to admit the finger, (as you will see by the part of a branch sent for inspection;) from which, in the summer, extravasated sap exudes, on which wasps and hornets delight to feed. In two or three years after being attacked, the trees, if left to the devastations of the grub, will assuredly die. I have for several years observed the wonderful effects produced by grafting some of the new Belgic pears on unhealthy trees, of tender sorts, in transforming them at once into health and productiveness; and this induced me to try the experiment on those trees which were being devoured alive. I calculated that, if, by some analagous change, the sap could be made healthy, it would also make it unpalatable to these worms of corruption.

It is now perhaps three or four years since I commenced operations, by grafting on diseased and half-devoured green chisel pear trees, the glout morceau; the autumn, or Williams's bon chretien; Marie Louise, passe Colmar, and other good hardy sorts, and the effect is beyond measure surprising. Trees that *must* have died in two or three years are now full of health and vigor, and are covered with bloom buds; not a speck of canker or disease is to be seen, and in two years from grafting the grubs left the trees; the sap having become either too abundant, or too healthy for their appetites.

The difficulty is to ascertain, before grafting, what sort of Flemish pear will suit the soil; for often, after two or three years of deceitful vigor, the graft, if the sort is not hardy enough, will become diseased, and disappoint all expectations. Therefore, before decapitating the old pear trees, advice should be asked on this score; and I believe that any practical man of observation can at once say what sort will flourish, if you tell him the substratum; though it really seems that many of the Belgian pears will grow in any soil and situation, at least in this southern part of England.

I am aware that I am advancing no novelty in what follows; but this sudden change from disease and death to health and vigor is quite worth a moment's consideration, either from the physiologist, or the commercially interested fruit-grower. By giving a tree shoots hardy enough to stand against our cold and moist climate, you give it the only proper and effectual organs of respiration and elaboration; and the consequences are, continued health and productiveness. It is interesting to observe the totol reverse of this, if some of the old and tender sorts of apples and pears are allowed to grow, and "have their way," alongside trees grafted with hardy varieties. The shoots of the tender sorts, even the winter after being produced, generally begin to canker and decay; the sap, in spring, losing its proper and healthy channels, forces out at the bases of these cankered shoots others that, in summer, are strong and luxuriant, but which again, in like manner, in the following winter, canker and die. The juices of the plants, from not being properly elaborated, become diseased, and food fit only to nourish those animals that seem created to feast on decay; while the whole tree becomes a confused mass of dead and dying branches. From close observation of the effect of these last two or three favorable warm summers, I cannot think this altogether produced by the climate, but that it arises from some inexplicable effect proceeding from the variation of soils; for, in situations which, as far as regards climate, are more moist and cold than any in this part of England, I have seen sorts that canker here flourish without spot or blemish. I am, however, almost equally at a loss when I impute it to unfavorable soils, as we have here a most remarkable variation in soils, from a dark strong clay, to a rich friable stratum of loam, 10 ft. in thickness, resting on a substratum of dry sand, *apparently* the most favorable combination possible for fruit trees; and yet, even here, some of the old

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us to prepare a stock of food for our worms, should any accident deprive them of the mulberry leaves, or should they be hatched before the trees have produced any. Gather in the autumn, before the frosts commence, and in dry weather, the leaves of the mulberry tree, which must be dried in the sun, by spreading them on large cloths, reduce them to powder, and lay them up in a dry place; when it is necessary to feed with this powder, let it be moistened with water and spread round the worms, who will immediately feed upon it. Other food has been prepared to feed with, such as lettuce, endive, &c.; but we are assured by a person of great experience, that the silk produced by any other food than mulberry leaves, is of an inferior quality, and the worms are sickly.

varieties of pears, such as crassane, brown buerre, Colmar, &c., in five years from the graft, canker, and seldom show a fruit-spur; but graft these cankered trees with new and hardy sorts, and fruitfulness and health will immediately take the places of disease and death.

The grand point in fruit culture is, to have sorts producing shoots that do not die at the extremities; they will then furnish leaves enough for all the offices of nature. This is no new doctrine, as we have been often told the *effect* of fruit trees in producing tender shoots; but the *cause* is still worth inquiring into: for well I know that it has often, and with apparent justice, been attributed to cold seasons and wet soils: though I know equally well that it occurs in seasons and soils quite the reverse.—How, then, shall we account for the circulating fluids being so inimicable to health in some varieties of fruit, and not in others? I can also assert, from experience, that sorts of fruit recently obtained from seeds are not by any means all exempt from canker; for several seedling apples and pears (perhaps the average may be one in a hundred) I have found equally or even more tender than our old verieties; I have grafted these tender striplings with robust sorts, and have at once changed their nature. This is interesting, and, to a reflective mind (it must not be overburthened with the cares of a nursery,) offers a vast field of inquiry. I must conclude with one recommendation: let the fruit amateur or orchardist, the instant he finds a fruit tree making shoots it cannot support, either root it up, and plant it afresh; or graft it with some robust and productive variety.

Sawbridgeworth Nursery, Herts, April 20, 1836.

From the same.

ON THE TREATMENT OF OLD FRUIT TREES WHICH IT IS WISHED TO PRESERVE; AND ON THE ADVANTAGES OF LAYING COW-DUNG AT THE BASIS OF THEIR TRUNKS, AND ALSO AT THE ROOTSTALKS OF VINES.

BY W. A. L.

In most old gardens there are to be found aged remains of some favorite fruit tree, which the proprietor is unwilling to have removed, either from its having produced excellent fruit, or from early associations connected with it. Hence it still retains its place, though age, the chisel, and the pruning-knife have been hard upon it, and it remains a heartless stump, and almost leafless skeleton of a tree.

Such was the case, some twelve years ago, with a green gage plum tree, which for many years had been trained against a wooden fence ten feet high, and had long delighted both old and young by the yearly produce of an abundant crop of delicious juicy, high flavored fruit, but it was now old, and exhausted; and its yearly crop were "few and far between."

In the course of some judicious improvements, it was found necessary to remove the old wooden fence, and to build in its place a substancial brick wall. By this event, a favorable opportunity occurred to have the old plum tree removed, and a young healthy tree planted in its place. Having represented to my employer the propriety of so doing, his answer was, "I wish if possible, to preserve it: it has produced excellent fruit, and was a great favorite with my father. See what you can do."

As many young gardeners, on entering their first situation, may be similarly circumstanced, I will relate the means I adopted, together with the result. In the first place, I cut down the tree to the lowest live wood on the bole (which in this case, was 2½ feet from the ground,) leaving the branch 20 inches long; I then collected four barrow loads of fresh cow-dung, and laid it round the stem to the distance of four feet on every side, and rising conically six inches above where the trunk was cut off; and, in order to conceal the unsightly appearance of the dung, I covered it with sand two inches thick. This was done in February; and in due time the live buds of the branch broke, and grew apace.—During the heat of summer, the surface of the dung became finely pulverised; and, on examination, I found that strong healthy roots had issued from the bottom of the branch which was left, and had spread through the whole mass of dung which enveloped it. The following spring, I gave it another coating of the same, extending to the distance of six feet; repeating it the third year, and occasionally since. The result was that the tree grew so rapidly, that I was soon enabled to form a handsome, well-regulated, fan-shaped head, which fills the whole space of its original allotment, and has borne, for these eight years past, excellent and abundant crops.

This is a mode that may be safely adopted with old fruit trees that are worthy of preservation, whether cut down or not. In the latter case, I would recommend that the soil be removed to the distance of four or five feet from the bole, to the depth of the strong leading roots, and a layer of fresh cow-dung, six inches thick, spread on them, and covered with sand, and left for one season to the influence of the sun and air. It will soon be discovered whether the cow-dung acts beneficially, by the renewed vigor of the tree, and its sending forth young wood. In this case, a judicious pruning of the old wood is necessary; and, in the spring, another and more extended layer of dung should be added.

Where vines are planted on the outside of forcing-houses, and the roots have got into improper subsoil, the removal of the soil from the stem, and a barrowful of fresh cow-dung laid round them, never fails to cause the protrusion of strong vigorous roots. but it is advisable not to begin forcing early, when it is applied, as the moisture, in very cold weather, may prevent the due circulation of the sap.

From the Ohio State Gazette.

SILK CULTURE.

As the capability of the Morus Multicaulis to endure our winters has been agitated, and as the tree is decidedly the most valuable to the Silk grower, (in which class a great many western farmers are already enumerated,) I propose to give a few general directions as to its cultivation; the common sense of which, and the fact that they are *practical* and *theoretical*, will, I trust, recommend them to every farmer who is the least interested in this subject.

Such is the luxuriant nature of the Morus Multicaulis, that it will grow in almost any soil, and unless checked by the poorness of a soil, or if in a soil rich by artificial means, it will continue to grow green until the unripe parts of it are frozen, which is an operation no tree will endure, for the unripe wood of every tree will be killed by the frost.

From this disposition of the Multicaulis to continue its growth, we derive a very common sense remedy, which is simply to put it on our poorer soils; and to save every twig, we must put it in a soil so poor that it will not grow at all without cultivation; we can give when we choose, and withhold when we choose, and of course control the tree. It follows then, that too much cultivation, or too rich a soil will kill the tree; the converse is, a poorer soil and less cultivation.

It is extremely doubtful whether there is any land under cultivation, west of the mountains, so poor as that the Multicaulis will require cultivation on it. A very experienced and successful cultivator, and one who has many thousand trees, which have endured the two or three last winters, says "the best soil for the Multicaulis is dry loam, as well gravelly or stony, resting on a gravelly or open sub-soil, that will freely let the water pass off, and give no obstruction to the roots; or a medium quality, safer to be too poor than too rich, for I am confident that my land which is occupied by the mulberry is in better condition than when first set with it. It would be as well if the land was cultivated a year or two without fermented manure, unless quite low in condition before the trees were set in it. Sandy soil is next best, if not too loose and rich with manure. Rich, moist soil is wholly out of the question."

From the above qaotation farmers will perceive that their greatest danger in the cultivation of the Multicaulis arises from the richness of the soil; and yet no one can doubt that there is enough of a medium quality to raise large quantities of Silk; and there is little doubt that time will prove what now seems paradoxical, that the *poorest* soil of the country is the *richest*.

The whole matter may be summed up in a few words. Plant the Multicaulis in a poor soil, and unless very poor, withhold all cultivation, except simply to keep down the weeds, and in any event, do not cultivate or disturb the earth after about the middle of August.

MULBERRY TREES.

The white Italian mulberry trees, which are the growth of seed sowed last spring, require to be defended from the severity of the coming winter by a covering of earth, straw, chaff, or horse manure. They may be buried several inches, and probably earth or manure will afford the surest protection. If they are thus carefully covered so as not

to break down the tops, it is believed they will be as certain to survive and be fit for transplanting in the spring as they would if taken up this fall and put into a cellar.—They should be covered before the approach of severe frost. One gentleman in this town cropped off the tops of his mulberry seedlings in the month of August, when they were about ten inches high; he also deprived them of nearly all their leaves at that time. Since he thus cut off the tops and the leaves, the main stem and branches have become firm and ligneous, although they have not increased in height—a second crop of leaves has come forward, so that they have lost their denuded appearance, and look remarkably tough and healthy, and will in all probability resist the effects of winter better than seedlings which have been allowed to grow without being cropped or deprived of the first growth of leaves.

The surest way of securing the Chinese mulberry trees is either to put them into a cellar, or to dig them up carefully and turn the tops and branches down to the ground—they may then be covered with a layer of cheff or straw, and dirt to the depth of a foot thrown over the straw; the Chinese Mulberry, being more tender than the white variety, should be taken care of at an earlier day. The branches of the Chinese mulberry trees, which are designed for slips next year, should not be cut off until the spring.

It has been ascertained by experiment that white mulberry trees one year old are more likely to live if transplanted at that age, than they are if they are allowed to remain in the nursery two or three years.—The distance at which they should be set as standard trees is, 5 feet in the rows, and the rows 8 or 10 feet apart; the intermediate space between the rows may be improved in the cultivation of white beans or potatoes, so that there shall be no waste of ground.

SCAB ON WHEAT.

A few days ago a friend called my attention to the great injury to the wheat and rye crops from what is usually called the scab. The cause of destructive disorder soon became a subject of inquiry and speculation—I stated the cause of scab to be (which is the current opinion) the inclemency of the weather, whilst the wheat was in bloom; the blossom being broken off too early created disease by a want of that nutriment furnished by nature. He remarked that such had been his opinion—but that he had accidently noticed the wheat and found in almost every head a small black insect, often seated upon the point of the grain, that he pursued his examination and found it general in the field. My curiosity was excited by his remarks, and I proceeded to a large field of rye and wheat; in various parts of the field I broke off the heads and found the insect he described sometimes in a white state and sometimes black, about the size of the blossom of the wheat. The insect was always within the outer covering of the grain, and evidently fed upon the wheat. The field of rye and wheat is almost entirely destroyed. It would be worthy the notice of the farmer to examine his wheat and rye. A SUBSCRIBER.

A PRECOCIOUS HEIFER.

24th June, 1836.

* * * I cannot lose this opportunity of informing you of a singular fact which happened in the vicinity of Hampton very lately. Capt. Spencer Drummond has a heifer of the Durham stock, only fourteen months old, which has a calf about a fortnight old, and is a much finer calf than we commonly meet with in this neighborhood, or in yours. I mention this because I consider it unprecedented.—[Farmers' Register.]

A new manufacture has been introduced by a M Leinard of Pont Remy, in France, which promises to be of the greatest utility. This gentleman has brought to perfection a plan of working up the Phormium Tenax,—a plant that grows in the vallies of New-Zeland, resembling the corn flag, and the aloes--into a fabric said to surpass linen in pliancy, substance, and lightness. Many English merchants have endeavored to make use of the plants, the beauty of which, when wrought into cloth by the Indians, had attracted the notice of the most distinguished travellers, but in vain, owing to their not being able to divest it of a resinous gum which forms a portion of its consistence. Mr. Lienard has established a factory at Pont Remy, in which one thousand workmen are said to be employed, with the prospect of the number being increased to three thousand by the great demand for the cloth, which is said to be peculiarly suited for sails, and the coverings of carriages, as it may be placed under water for any length of time without injury. It is supposed that its use will, in the course of time, supercede that of cotton in France. The culture of the plant has been introduced by Marshal Clausel at Algiers.

A correspondent informs us that excavations have lately been made on a farm a short distance from this village, for the purpose of obtaining coal, which are likely to result in finding a full supply of this valuable article. Specimens of Anthracite have already been obtained which burn free, and the quality of the coal improves, and the quantity increases, as the shaft is extended. The work which was interrupted by a flow of water, is about to be recommenced with the aid of machinery, and will be prosecuted by a mining company possessing a large capital—$150,000 of which is already paid in and deposited in one of the New York banks. Our friend is very sanguine in his opinion of the success of the undertaking, and speaks of the great importance of the discovery to Newburgh and the surrounding country, as the cartage of coal to our doors will be but 50 cents per ton. We hope he will not be disappointed. It is said that Capt. Kid buried his money somewhere. If the company, in searching for coal in this neighborhood, should find the hidden treasure, the speculation will be profitable.—[Newburgh Journal.]

CORN CROP.—Four or five weeks ago, it was feared there would be but little or no corn in this country; a spell of warm weather succeeded, which very materially changed the appearance of the fields, which now promise a greater yield than was had last year.

To show the difference of estimate on one field of corn of 20 acres in the town of Portland, which we are told will hold good for the major part of the corn crops in the same town, the owner about four or five weeks since offered the entire crop for $100 about what it might be worth for fodder only, and could not find a purchaser; within a few days he has been offered $500 for the same field, and refuses to take it.

The Potatoe Crop, on the authority of intelligent farmers, was never better.—[Dunkirk Beacon.]

CHRONOLOGY OF COTTON.—Yarn first spun by machinery in England 1730—Arkwright obtained patent for spinning frame, 1761—Mule spinning invented, 1779—Watts' steam engine, 1782—power looms invented by Dr. Cartwright, 1785—Sea Island Cotton first planted in United States, and upland cotten cultivated, 1789—Slater, an Englishman, (lately deceased,) builds the first cotton factory in the United States at Pawtucket, 1790—Eli Whitney invents the cotton gin, 1793. The second cotton factory in the United States erected in New-Hampshire, 1803—Power loom first introduced in the United States at Waltham, 1815—First factory erected in Lowell, 1822—Highest duty on cotton manufactures, 1829.

The number of cotton factories in the United States at the present time, we have not seen stated, but there are now in England 1154 cotton mills. Water power to the amount of 10,000 horses, and steam power to that of 30,000 are employed in them—two hundred and twenty thousand persons are directly and one million and a half are indirectly engaged in them.—[Newburyport Herald.]

BERKS COUNTY SILK.—We have recently examined a specimen of *sewing silk*, the first ever manufactured in this county, and it was of such a quality, and the manner of its production so creditable, that it did our hearts good. It was the entire production of a young lady near Reading, one of Berks county's fairest daughters, who reared and fed the worms, spun the silk from the cocoons, and doubled and twisted it into skeins, all with her own hands. Here now is the example set to our young ladies, and we are persuaded they are about to imitate it, as a large quantity of mulberry seed has gone into different parts of the county from this place. How irresistible would be the charms of the young lady, when dressed in the fabric of her own hands' production, and how eagerly would the *beaux* press forward for her hand!—and well might they seek such wives, for they would be worth having.—[Reading Press.]

From the Farmer's Series of the Library of Useful Knowledge.

BONES AS MANURE.

Bones, although of comparatively late introduction as manure, have yet occupied so much of farming attention within these few years, that we have no hesitation in placing them at the head of those miscellaneous substances which are usually employed for that purpose. They have indeed been used in some parts of England for a long time, and have been extensively imported from the Continent into the town of Hull, where several machines have been erected either for grinding them into powder, or bruising them into small pieces; which modes of application have been found so advantageous, that they have, within the last twenty years, excited general attention, and are now in almost universal use as the principal manure for raising turnip crops on the calcareous soils in Yorkshire and Lincolnshire. It is upon this description of land that they are the most decidedly valuable, and the testimony of some farmers of experience, proves that to mix them with a portion of vegetable or coal ashes, is a profitable application for the production of turnips; as, by this method, the vegetation of the seed is quickened, and the young plant, getting rapidly into rough leaf, thus escapes the fly.

Long before the great advantage which may be derived from ground or well-crushed bones was generally known, many persons were aware of their fertalizing properties. To render them available, however, the wasteful and injurious process of reducing them into ashes by fire was then commonly resorted to; by which, indeed, a certain degree of benefit was imparted to land upon which sulphate of lime or gypsum will have effect, but could not be so effectual, in point of nourishment, as bone in an uncalcined state, because the oil and other nutritive matter which it contains is thus dissipated. In other instances, they were either reduced by lime, or laid at the bottom of the farm-yard, and decomposed by the effect of urine, and in some cases were partially broken by the hammer. In these modes, however, great quantities were wasted, which is now prevented by the improved method of preparing them by machinery: it is therefore useless to enter further into the details of practice which has become obsolete.

When reduced to powder, the bones alone are ground, being divested by the process of boiling, not only of every particle of flesh, but also of a material portion of oil which is also extracted; and it is only in that state that they can be brought to the condition of fine powder. In this state, it is only reasonable to suppose that they cannot be so beneficial to the land as when fresh and unboiled; yet we find, by the report of the Doncaster Association "on bone manure,"—to which we shall presently refer—that they have been found more effectual after having passed through the manufactories. When not ground completely into powder, they are, however, broken in the machines, by cast-iron rollers, formed with deeply indented rims, by which they are first partially bruised, and then falling down upon other sets of rollers, each with the teeth more closely fixed they are in this manner reduced to various sizes, from one inch to half an inch in thickness, and a considerable quantity of coarse dust is also procured by the process. These bones are usually sold under the respective designations of inch, three-quarters inch, half-inch, or dust; but the greatest demand is for those of the half-inch size, which contain all the dust which has been formed in crushing them. The "dust" is collected in great measure by ridding the inch and three-quarters inch bones.

When the bones are not boiled, each pair of rollers is furnished with a set of malleable iron scrapers attached below, in order to clear the teeth of any animal matter which may adhere to them, and thus the oil substance contained in the bones is saved.* As bone-mills have been now very generally erected, there are few parts of the country where the manure cannot be procured in a prepared state; but when the bones are only to be had raw, and it is an object with the farmer to reduce them to a small size, they can be easily broken to pieces by his own laborers. Several farmers have indeed erected small machines with two cylinders of cast-iron, with teeth, which lock into each other, by which they are broken into small pieces. The price at the mills varies, of course, according to the trouble of preparation, the distance of carriage, for grinding, and the demand; but commonly average, for the dust, from 2*s.* 6*d.* to 3*s.*, and in some late instances even 3*s.* 6*d.* have been paid—for pieces, from 2*s.* to 2*s.* 3*d.*, according to size—and 1*s.* 10*d.* for rough bones, per imperial bushel. No allowance appears to be generally made by the dealers on those which have gone through the process of boiling.

The expense of bones purchased in the rough state, and broken on the farm, is thus stated as an actual charge incurred per acre—

24 cwt. bones, prime cost,	£2	3	2
Carriage of ditto, 7 miles,	0	7	0
6½ days, man breaking bones, at 1*s.* 10*d.*,	0	11	11
3½ do. a girl spreading do. on the drills,	0	2	11
	£3	5	0

EXPERIMENTS.

The effects will be best seen by the following trials:

On the estate of Garrowby, on the Yorkshire Wolds, belonging to Sir Francis Wood, the crops of turnips had dwindled to nothing, and the fallows, though tolerably manured, were covered only with common hemp, nettle, and other weeds, instead of turnip plants; but by the use of twelve to twenty bushels of bone dust in drills, the turnip crops have become excellent, and the following crops are very considerably improved.*

At Clumber Park, the seat of the Duke of Newcastle, in Nottinghamshire, 600 bushels of small bones were, in 1822, spread upon twenty-four acres of grass land, in the dairy farm, consisting of dry, sandy, and gravelly soil, which had been laid down about ten years. Their effect upon the pasture improved the condition of the cows so materially, that about twice the quantity of butter was made from them than from cows grazed upon land of similar quality, but not boned; and this effect, it is said, still continues.†

Twenty-five bushels of bruised bones, per Scotch acre, having been applied by Mr. Watson, of Keillor, near Cupar Angus, to Aberdeen yellow turnips, on some sharp black land, brought them above ground on the third day, and into rough leaf on the tenth; on the fifteenth, they were fit to be thinned out; while farm-yard manure, though applied to the same soil, at the rate of twenty-five cart-loads per acre, did not bring them up till the fifth day, nor render them fit for the hoe until the twentieth.—They in this manner manifested the same superiority until the month of September, when the weather having set in dry, it was expected that the crop would cease growing; which was the case with that part which had been dunged, but the bone turnips continued to grow vigorously, and upon a comparative trial in the middle of October, their produce exceeded those which were dunged, by six tons per acre: twenty-eight tons to twenty-two.‡

On some land, the quality of which is not stated, crushed bones were laid by Mr. Falla, of Gateshead, near Newcastle-upon-Tyne, at the rate of 100 bushels per acre; the rest of the field being manured with well-rotted stable-dung, at the rate of fifteen two-horse cart-loads per acre; that part which was boned was superior to some parts of the dunged ground, and fully equal to the rest.§

Mr. Graburn, of Barton, in Lincolnshire, has manured with crushed bones, at the rate of thirty bushels, and with dung at eight loads per acre, for turnips, after which the turnips were much later than the rest. On the second year of seeds, after the turnips, he covered the dunged part with yard manure a second time, and two years afterwards, a third time; then sowed the land with wheat, and the boned ground produced rather a better crop than that which had been thus thrice dunged.‖

During the dry summer of 1826, thirty-four acres of a siliceous sandy soil, on the estate of Sir Charles Throckmorton, at Buckland, in Oxfordshire, half of which had been manured with farm-yard manure, and the remainder with bones. The whole

*See the Prize Essays of the Highland Society, for a detailed description, accompanied with plates of a very complete mill for crushing bones, erected by Mr. Anderson of Dundee.—N. S., vol. i. p. 301. Ibid p 78.

*Doncaster Report, p. 6.

† Ibid. p. 13.

‡ Quart. Journ. of Agric. N. S., vol. i. p. 14.

§Farmer's Magazine, vol. xvi. p. 300.

‖Lincoln. Report, p. 300.

was sown with turnips, drilled in the Northumberland fashion; and that portion on which the bones were laid presented a remarkably fine crop, nearly a fourth part advanced in bulb about the latter end of August, while that part which had been dunged was merely getting into leaf.—The experiment was repeated in 1827, on green-globe turnip, sown on the 20th of July, upon similar lands, with the same superiority in favor of the bones; the succeeding crop of barley also produced five bushels per acre more than that which followed the dunged turnips, and the cover was also heavier.*

The Honorable Captain Ogilvie, of Airlie Castle, has also applied bone dust, at the rate of 15 and 20 bushels per acre, to a light sandy loam, with a subsoil of gravel and sand, coming in some places nearly to the surface; and after the experience of five years upon a series of trials commenced in 1827, he found all the successive crops of turnips, barley, and grass-seeds so decidedly superior to those which had been previously produced by other manure, that the Highland Society last year awarded their honorary silver medal to his Report.

To these facts in favor of bone manure, others must, however, be also stated of an opposite tendency, particularly when placed in opposition to farm-yard manure, to which we wish to call especial attention in comparison with bones, as being at the command of every farmer.

On the estate of Mr. Evans, jun., of Dean House, also in the county of Oxford, bones were tried for the wheat crop upon calcareous stony land, in comparison with stable-yard manure; but the dung had so greatly the advantage, that the bone crop appeared but little if any degree better than that on soil without any manure whatever.†

On the lands of Mr. Hawden, in Kincardineshire, turnips were sown in the month of June, on various soils, in drills laid off at 27 inches apart: the manure was laid on in single Scotch acres; and the produce of the roots, exclusive of tops, accurately weighed, as follows:—

On a mixture of stiff clay and gravel,	
12 tons of farm-yard manure produced	26 tons 8 cwt.
1½ " bone-dust,	" 23 " 12 "
On a soft sandy soil, naturally inclined to moor,	
16 tons of farm-yard manure, produced	29 tons 12 cwt.
1½ " bone-dust,	" 24 " 16 "
On sandy light soil, sown the following year,	
16 tons of farm-yard manure, produced	25 tons 16 cwt.
1½ " bone-dust,	" 23 " 18 "
10 cwt. horn-shavings, mixed with one cart-load of hen-dung and 9 ditto coal-ashes,	" 20 " 6 "

It is also remarkable, that although three of the drills were spread unmixed with the horn-shavings, which are considered as a more powerful manure than bone, yet they only produced at the rate of 2 tons 13 cwt. per acre ‡

*Prize Essays of the Highland Society, N. S., vol. i. p. 75, communicated by Mr. G. Sinclair.

† Ibid. p. 77, communicated by Mr. G. Sinclair.

‡ Prize Essays of the Highland Society, N. S., vol. i. p. 69.

On Mr. Boswell's farm of Kingcaussie, in Kincardineshire, two acres of Norfolk globe turnips were drilled upon poor high ground, reclaimed from moor, and

20 car-loads, or tons, of dung produced	32 tons 14 cwt.
1½ ton of bones	" 28 " 13 "

On the same farm, in another year, the season of 1824 being cold and wet operated very much against the turnips which were manured with bones; but in that of 1822, those raised with bones and stable dung, appeared to be equal.*

Notwithstanding this evident difference against the produce obtained by bones, in point of weight it should not, however, escape remark, that the latter gentleman estimates the value of their return in money as being superior; for the cost of the two manures is, according to his calculation, as follows:—

One acre manured with farm-yard dung—		
20 cart-loads of dung, including carriage, at 10s. per load,		£10 0
33 tons of turnips, at 10s per ton,		16 10
Nett return,		£6 10
One acre manured with bone—		
1½ ton of bones, at 42s.	£2 12 6	
Breaking and driving ditto,	0 18 0	
		3 10 6
29 tons of turnips, at 10s. per ton,		14 10 0
Nett return,		£10 19 6

Thus leaving a difference in favor of bones of no less than £4. 9s. 6d.—or what we should in this country call a tolerably fair value, if fed off, for the produce of an imperial acre: but although the price of the turnips is far beyond present rates, and the charge of dung, unless carried to a great distance, is too high, we yet leave the account as it stands, as forming a ground for similar comparative calculations.

To this may be added the following particulars of a comparative trial between stable-manure and crushed bones, lately made on the property of Sir William Maxwell, of Calderwood. The field was an old ley, consisting of strong loam, on a retentive clay bottom; but having been completely drained, as well as ploughed and cleared, under favorable circumstances, the condition of the land—from which the previous crop of oats had been taken in 1832—was perfectly satisfactory at the time of preparing it for turnips, with various species of which it was sown in the following spring; and in addition to the quantities of manure stated at foot, 7½ chaldrons of lime were laid per Scotch acre. Where the stable-manure had been applied, the plants sprouted more rapidly and vigorously than was the case with the bones; but ultimately the latter gained ground, and, if any thing, got rather the start of the dung, and no part of the crop suffered in any degree from the fly. The most accurate calculations were made in order to ascertain the produce of the crops per acre, and the following was the result:

Swedish,	
30 cart-loads of stable-dung per Scotch acre, produced	29 tons
60 bushels of crushed bones	" 24
Dale's Hybrid,	
30 cart-loads of stable-dung	" 33
16 bushels of crushed bones,	" 31
45 ditto,	" 29
Yellow Bullock,	
30 cart-loads of stable dung	" 29
60 bushels of crushed bones,	" 28

*Prize Essay of the Highland Society, N. S., vol. ii. p. 206.

The quality of the soil is, however, by no means particularly well adapted for the turnip culture, partaking, as it does, rather too much of the clayey character; and although it was divested by drainage of all superfluous moisture, yet there can be little doubt that to that cause the comparatively unfavorable effect of the bones may be chiefly attributed.*

EFFECTS OF BONE-DUST AND BONES.

Bone-dust is the fittest state in which to lay it upon grass, for it will not only take more immediate effect upon the crop, but if laid in pieces, it would interrupt the progress of the scythe. It should, however, be recollected, that fine powder can only be obtained from spent bone which has undergone the process of manufacture. It is, therefore spread as a top-dressing, by hand; but it is also very commonly laid in the drills for turnips, for which purpose many ingenious machines have been contrived for sowing it along with the seed.† It is, however, much to be regretted that these implements cannot be constructed with more simplicity, for their cost is so considerable, that unless a man has a very large quantity of land to drill, their purchase would be imprudent, and the hire is generally unreasonably expensive.

Regarding the *quantity of dust*, the powdered bones are dearer than those which are merely broken small, and although said to be more forcing to the first crop, on account of their being, when in the state of powder, more intimately blended with the soil, and more directly applied to the seed, yet they are not found so durable as when they are laid on in pieces: but it is also true that, in the former case, they are not laid on so largely, for the amount depends entirely on the size of the bones. They have been applied in the rough state, to the extent of 100 bushels per acre; but the average quantity, of all sizes, is stated, in the Doncaster Report, to be 39 bushels.—When the smaller bones are distinguished from the larger, they, however, seldom appear to exceed 30 bushels per acre, and in many cases do not arrive at 20: perhaps it may be assumed, as the most general practice, that half-inch bones are employed at the rate of 25 to 30, and dust at 20 bushels per acre; but a distinction should also be drawn between the quantity of bone which are applied after being manufactured, and those which are laid on in a raw state.

The size of the pieces to which the bones should be broken is also an object of some

*Quart. Jour. of Agric., N. S., vol. iv. p. 839.

† A very detailed description of one of these instruments, along with an engraving, may be found in the Quarterly Journal of Agriculture, N. S., vol. ii. p. 719.—Another machine for the same purpose, but with a double hopper, for sowing two drills at one time, is also described, together with a plate, in the Prize Essays of the Highland Society of Scotland: N. S., vol. ii. p. 206.

importance, as the smaller they are the more prompt will be their effect: on which, the following observation has been made by one of the correspondents of the Doncaster Association: "That if he meant to till for early profit, and if he wished to keep his land for good-heart, he would use half-inch bones; and in breaking these, he should prefer some remaining considerably larger:" the reason assigned for which is, "that by using bones of a large size, with dust in them, there must be sufficient of the small particles of the dust to set the turnip crop forward, and sufficient of the large particles of the bone left to maintain the land in good condition for the last crop."

Respecting their durability, it has been affirmed, that the effect will not be increased if they be laid on to great amount; for the same produce has been obtained from the comparative application of 50 and 100 bushels; and an experiment has been tried by varying the quantity on different ridges of a large extent of ground under turnips, at the rate of 28, 40, and larger quantities alternately, without creating any visible difference in the crop.* This, however, may be perfectly correct, so far as regards one or two crops, for it has been found that, when used in large quantities, they have rendered the land extraordinarily productive during a great length of time, of which we find the following instances in the Doncaster Report:

1. On a field, part of which was boned forty years ago, the crops were, on that part, during fifteen or sixteen succeeding years, visibly better than the remainder, although the land was all of the same quality, and the part not boned was manured with farm-yard dung.

2. In another case, about three acres of light, sandy land were dressed, in 1814, with 150 bushels of bones per acre; since which time the land is said to have never forgotten it, but is nearly as good again as the other part, farmed precisely in the same way, with the exception of the one application of bones.†

We learn, also, from experiments at Kew, that although they yield a certain supply of nourishment to plants the moment they are capable of receiving it, yet that is done so gradually as to furnish only a regular and moderate supply: reasoning upon which, it is to be presumed, that as a large quantity does not produce the effect of forcing a crop in proportion to the amount supplied, neither can it be so soon exhausted by the gradual consumption of the smaller quantity. This application may therefore be perfectly consistent with good husbandry, if applied to any amount, however large; though, as regards the farmer's purse, the expenditure of the outlay is a different question. The extent of their fertilizing quality is greater upon grass-land, under cattle, than upon arable. Valuers estimate the allowance to a quitting tenant by supposing the effect of bones upon tillage and meadow-ground to be exhausted within four years; but on grass-land depastured it is considered to last during eight.*

Experience seems to be in favor of laying the manure in *drills*, especially when applied to turnips, although the superiority of the *broad-cast practice* is maintained by some very intelligent farmers, who hold—that the turnip plant receives its support principally from the fibres which it throws out sideways, to a much greater length than people will believe, and derives more nourishment from them than the tap-root; and that the bones being dispersed, the fibres are more likely to meet with them than when they are accumulated round a tap-root, and that method must be the best which occasions the greater quantity of nourishment to be conveyed to the body of the turnip. In drilling the bones, there is also a difficulty found in the after-ploughing, of mixing them with the soil; and although this may be in some measure obviated by cross-ploughing the ridges, yet that portion of the land on which the manure is thus laid receives more than an equal degree of benefit. A third mode is however acted upon by others, who sow them broad-cast, and gather them into ridges with a mould-plough.

The *time for laying them upon the land*, when applied to grass, whether natural or artificial, is generally recommended to be early in the spring; but if upon meadow, the growth of which has been fed off, then the moment the cattle are removed. Experience, however, varies upon this point; because it has been found to depend materially upon the season and the state of the land, which, if wet, will be more benefitted by delaying the operation until the weather becomes warm and the ground dry.

When applied in the drills of arable land, they are of course deposited along the seed; but when spread broad-cast, then they are not uncommonly either harrowed in immediately previous to the sowing, or with the last ploughing; though, when used in a fresh state, without having been subjected to process of manufacture, they should always be laid in sufficiently long before the sowing, to allow them time to ferment, or they will not take immediate effect upon the rising crop.†

The *soils to which they are best adapted* are those of a light and warm nature; for on wet and cold grounds they have rarely been found to produce any sensible benefit. Their power of contributing to lighten strong land, by their mechanical action upon the soil, and thus rendering it less adhesive, has indeed been vaunted, and, if laid on a very large amount, there can be no doubt that the bones, in pieces, would have some such effect; but the smallness of the quantity in which they are usually applied renders their force for that purpose quite insignificant.

On *heavy loams and clays*, the accounts of their operation have been almost invariably unfavorable; and it may be laid down as a necessary qualification in a soil fit for the application of bones, that it should be dry. This, indeed, has been contradicted by experiments stated in the Doncaster Report, upon what is described as a wet sand soil, with an irony-colored subsoil, upon which two quarters per acre were drilled, and produced an excellent crop, when manure had been previously tried without effect. This, however, having occurred in the years 1826 and 1827, which were unusually dry, may serve to explain the fact, without affecting the principle that bone manure is not generally beneficial to clay lands.

The same Report states, "*upon very thin sandy land*, the value of bone-manure is not to be estimated; it is not only found to benefit the particular crop to which it is applied, but extends through the whole course of crops; and even in the succeeding courses, its effects are visible in the improved quality of the land, and the efficiency of a smaller quantity than would at first have insured a crop. Upon much of the high land about Babworth, which is a light sandy soil, the crops under ordinary farm management were comparatively unproductive; but since the introduction of bones, after having been dressed for several fallows with sixty or seventy bushels per acre, they have not only become productive, but so much improved in quality as to return an equal crop with a much lighter dressing of manure or bones throughout the next course."

"On the *dry limestone* near Doncaster, the same favorable results have been obtained; and no failures, beyond those attributable to peculiarity of season, are noticed."

On the *Wolds of Yorkshire and Lincolnshire*, it also appears, by the testimony of several extensive farmers, that "before bones were generally used with turnip-seed, many thousand acres were annually sown for that crop without any manure whatever, from the impossibility of getting fold-manure for more than one-third or fourth of their fallows. The turnips upon such unmanured land were consequently very indifferent; and the benefit of sheep feeding upon their tops—for of bottoms they seldom had any—was very trifling. Since the use of bones has, however, become general, the turnip crop has been, in many instances, ten-fold, and in few less than four or five-fold its former bulk. All the suc-

*Quart. Jour. of Agric., N. S, vol. ii. p. 108.

†About sixty years ago, a farmer is also said to have had a new forty-years' lease of a tract of poor land, in a high situation near Rochdale, in Lancashire, on which, after fencing and draining it, he erected a bone mill, and began manuring the ground at the rate of 100 to 130 bushels of bones and dust per acre. The consequence of which was, that in a few years he let off more land than paid the rent of the whole, and retained a large farm in his own hand. The Correspondent of the Quarterly Journal of Agriculture, from whom these details are taken, says 'that one acre would summer a cow of large size, and that some fields were cropped with oats ten or fifteen years in succession; yet that it is surprising to see the herbage which the land still produces, both as to quantity and quality, near one half being white and marl clover.

*Report of the Committe of the Doncaster Agricultural Association, on bone-manure, p. 14.

†Doncaster Report, p. 16.

ceeding crops of grain and seeds have been amazingly increased, and, upon the four or five-shift system, there is no doubt the land will go on progressively improving, requiring a less quantity of bones annually, from its increased fertility and power."

On *light loams*, the return on the Doncaster Committee give bones a preference to farm-yard dung. And we learn that, upon the calcareous soil of the Yorkshire Wolds, heavy crops of turnips have been raised from 16 bushels per acre of bones, while in the same field, and under similar circumstances, but manured from the farm-yard at the rate of from 8 to 10 tons per acre, the turnips have been of the most inferior description.

On *peat soils*, if previously drained and laid dry, their advantages are reported to be so striking, that from fifteen to twenty bushels of dust per acre, drilled, have been also found to very far surpass the ordinary dressing of stable-dung, and even of lime and pigeons' dung.

On *gravels*, the reports are meagre and contradictory, though perhaps reconcilable in principle, as it has been justly observed, that "a gravelly soil may embrace every variety of texture and quality, from the light dry sand to the water-logged yellow clay—preserving in each the necessary admixture of stones and grit." To wet gravel, their application has been found decidedly unfavorable.*

ANALYSIS.

An examination of the component parts of soils, and of the power of bones, when applied to them as manure, would go far to explain the irregularity of their different effects upon various kinds of soil. Bone is known to consist of about equal parts of earthy and animal matter; the former chiefly composed of gypsum—which is of so indistructible a nature as to have been termed, by early chemists, the "earth of bones"—and a small portion of carbonate of lime; from which we may conclude that probably half the weight of bones is in the greater part consumed by plants as direct nourishment in their state of growth, and that the remainder is more gradually absorbed by the soil, as well also as by the plants; for lime, though in small amount, is always present, in greater or less quantity, in all vegetable substances.

"The quantity of earthy matter varies according to the age of the animal; and, in like manner, the quantity of animal matter varies also in proportion to the condition of the animal. In the best kinds of bones for manure, viz., those from fat young animals, perhaps the following proportions may give an approximation to the relative quantities of each in 100 parts:—

Earthy and saline matter,	40	parts.
Cartilage and jelly,	40	
Fatty matter,	20	

The soft parts thus form, in the best bone, about sixty, and upon an average, perhaps, amount to fifty per cent., which are almost entirely constituted of the same elements of plants, and all of them, sooner or later, liable to be dissolved and absorbed by the roots. The cartilage, indeed, when the bones have been buried in a dry situation, is very indestructible; but when exposed to the action of air, water, soil, and vegetation, probably pass into the state of jelly, and be dissolved, or otherwise decomposed, probably at the time when the fatty matter—the decomposition of which begins almost immediately—shall have been nearly exhausted."*

This analysis has been taken from an anonymous essay "on the action of ground bones on plants and soils;" the author of which observes, that "although it be granted that the composition of bones is thus well calculated to afford nourishment to plants, it must be admitted that the amount of their action as a manure still remains in a great measure unexplained. The quantity allowed per acre is not usually more than 10 or 15 cwt., of which not more than a half is efficient as manure; and this is but a small fraction of the weight which we carry off the field in vegetable produce. In these circumstances, we must either leve the matter unresolved, or have recourse to hypothetical explanation, to be confirmed or disproved by future observation." We agree with him in preferring the latter alternative, as best calculated to lead to a discovery of the truth; and as an inquiry into the cause of the different results occasioned by the specific application of bones to every species of soil would only lead us into a wide and probably fruitless discussion, we shall confine ourselves to an account of the analysis given by Mr. G. Sinclair, of the two kinds on which trials are mentioned by him to have been made in Oxfordshire.

That on the land of Sir Charles Throckmorton, on which the bone manure had such beneficial effects, contained in 400 parts:—

Fine siliceous sand, 167 parts; calcareous sand, 43; water of absorption, 99,	309
Decomposing animal and vegetable matter, destructible by fire,	24
Carbonate of lime (impalpable,)	25
Silicia, or the pure earth of flints,	23
Alumina, or the pure matter of clay,	9
Oxide of iron,	3
Soluble animal and vegetable matter principally vegetable extract, with indications of muriate of soda,	5
Moisture and loss,	2
	400

That on the land of Mr. Evans, jun., on which the bone manure appeared to have no beneficial effect, consisted of:—

Calcareous sand and gravel, nearly pure carbonate of lime,	217
Decomposing animal and vegetable matters, destructible by fire,	17
Carbonate of lime (impalpable,)	39
Silicia,	85
Alumina,	20
Oxide of iron,	5
Soluble matter, principally vegetable extract, with sulphate of lime, or gypsum,	4
Moisture, or loss,	13
	400

On which he remarks, that "the striking and essential point of difference between these two soils consists in the carbonate of lime. In the soil so much benefitted by the bone manure, carbonate of lime is deficient, while in the soil so little benefitted by it, the carbonate of lime is almost in excess; at least, had it not been so much in the form of gravel and sand, the soil would have been what is termed cold. The differences, also, between these two soils, in the coarseness and fineness of their sand and gravel, and the superior quantity of alumina, or clay, in calcareous soil, should not be overlooked."

The quantity applied to the siliceous sandy soil, where the bones had such beneficial effects, was 36 bushels per acre, partly supplied from the dog-kennel, and partly purchased. On the calcareous soils, they were applied in a large quantity, and also in a recent state; on which Mr. S. observes, that "animal matter being so much more easily decomposed than vegetable matter, the recent bones must afford nutriment to the soil very speedily;" yet he adds, "that he has always found that both animal and vegetable matter, before they become beneficial to an immediate crop, require a first stage of decomposition, and that this degree of fermentation or decomposition is best effected before these substances are applied to the land."

This accords with the Report of the Doncaster Association, in which it is said "to be acknowledged by their correspondents to be a prevalent opinion among intelligent farmers, that manufactured bones are equal in their effect to raw bones;" in proof of which they instance the following experiments:—

Twenty-four acres having been boned at the rate of 50 bushels per acre, part with bones which had the oil stewed out of them, another part with bones which were full of marrow, and a third part with horses' bones having much flesh upon them. The crop, which was turnips, was all good, but the next crop, where the fleshy bones were laid, was not so good.

Broken bones fresh from dog-kennels were spread on a newly-ploughed clover ley of high sand land, at the rate of 80 bushels per acre, and on the following day sown and harrowed in with wheat; but the crop was bad, and no advantage was observed to be derived from the bones in the succeeding crops. The same experiment was repeated upon a piece of fallow in Blyth Forest, sown with turnips, with similar results; but the same gentleman having sent bones from the dog-kennels to be broken, and then laid upon a heap, and covered with earth, in which state they remained for about a month, after which they were laid upon turnips: their good effects were visible on every yard on which they spread, being the largest and the best turnips in the field, although the other part was manured from the farm-yard, where a considerable quantity of oil-cake had been consumed.

These experiments certainly tend to confirm the fact, that fermentation is requisite to give immediate effect to bones as manure, which is only in accordance with the chemical principles applicable to all animal substances; for we all know, that although flesh, if buried in the earth, will not produce any benefit to the land until it is decom-

*Doncaster Report, p. 8.

*Quart. Jour. of Agric., N. S., vol. i. p. 49.

posed, yet that object once attained, its fertalizing powers are instantly brought into force; but we cannot admit that this warrants the conclusion, "that manufactured bones are equal in their effect to raw bones." They may indeed be superior on a first application; and we make no doubt that when thrown together and rendered putrid, they will become more promptly available than if they had undergone no fermentation whatever. Yet we feel persuaded, both from the nature of animal matter as manure, as well as from much inquiry regarding the practical application of bones, that when deprived by manufacture of the gelatin and oil which they contain, their improvement of the land will not be so durable as when they are laid on raw, or after fermentation when collected in a fresh state.* Many farmers are thus imposed upon by dealers; but the bones are sold to those who are aware of their real value, for much less than the price of those from which the oily substance has been extracted.

COMPOSTS.

The fermentation of bones naturally leads to the consideration of the subject of forming *a compost of bones with earth and other substances*, by a mixture with which they soon become decayed and pulverized—a practice which is stated in the Doncaster Report to have been recommended by several very intelligent farmers, thirteen of whom, solely from the result of their own experience, describe its effects as superior to those of bones used singly. With some of these, it is the practice to mix 50 bushels of bones with 5 loads of burnt clay, or good earth, per acre; by which dressing, the crops between fallow and fallow, excepting clover, appear to have been increased one-fifth in value. Others use forty bushels of bones, broken from two to three inches, in a compost with five loads of farm-yard manure, and a sufficient quantity of earth, the effect of which has been felt on the wheat crop at the end of the four-course system. Many also mix up dung, root, rape dust, and the ashes from weeds and house fires, with the bones, by which great heat, and consequent fermentation, is occasioned.

The most general practice, however, is to form the compost entirely of bones and yard muck, mixed, in various proportions, with

From 50 bushels of bones	to	4 or 5	of dung.
20	do.	4	do.
12	do.	8	do.

This, if the heap be well covered, will no doubt decompose the bones very rapidly; and one person states, "that he has used as much as 35 bushels of bone dust, per acre, without manure, in the same field where he laid six loads of fold manure, and ten bushels of bone dust; but the turnips on the part manured with bone dust alone were not so good as those on the part manured with the compost and the succeeding crops were still worse in comparison."

As the great amount of bones now actually consumed as manure, besides the quantities applied to other purposes, may reasonably excite an apprehension that the still increasing demand will soon exceed the supply and consequently raise the price, a correspondent of the "Quarterly Journal of Agriculture,"* has suggested the following economical method of employing them, which he has used for the two last years, and by which he states that he has obtained heavy crops of turnips.

He forms a compost, as the manure for one imperial acre, of 8 bushels of coarse bone-dust, with no less than double that quantity of coal-ashes, which may be generally procured for about 5s. per ton. The ashes should be carefully collected in dry weather and placed under cover, in order that they may be kept free of moisture, or, if that be difficult, they may be strewed with a dusting of quick-lime; after which they are to be riddled as small as the dust itself, for otherwise, if sown with a drilling-machine, they will not pass easily through the hopper. The bones are then mixed with the ashes; the mass ferments, and evolves a considerable degree of heat, when they soon become fit for use.

Turnips raised with this compost, he affirms to have always possessed the same characters of a close crop, from root, and hardiness to resist the rigors of winter, that turnips raised with bone-dust alone evince; in proof of which, he has sold them for £7 per acre, to be eaten off by sheep. He however, supposes that it is the bone-dust alone which secures to the crop whatever nourishment may be imparted to it at the future stages of its growth, in which he is doubtless correct; but in imagining that he has thus discovered a more economical mode of their application in their effect upon succeeding crops, we imagine that his further experience will show him that he has been deceived; for although the fermentation of the bones, occasioned by the application of the ashes, may increase their power upon the actual crop, it will be proportionably diminished in those which follow, and we think that the instances which we have already stated must convince practical men that the durability of their influence upon the soil depends on the quantity in which they are applied.

APPLICATION.

Independently of the decided fertalizing properties of bones, when applied to dry and light soils, they have the great advantage of being procurable at a small expense of carriage, which diminishes the labor o teams to a great extent; for one wagon-load of 100 bushels, broken small, will in most cases be found equal to 40 cart-loads of yard manure. They are also capable of being preserved during a long time, when farm business is not pressing; added t which, they leave the land freer from weed than when it is manured with dung. This, and their suitableness to the drill husbandry, renders them peculiarly adapted to the cultivation of turnips—to which, indeed, they have been the most universally applied; and we need not remind our readers, that on the success of that crop generally depends those of the whole succeeding course.—The instances are also numerous, upon all soils, of turnips being destroyed by the fly when sown in drills, having had the manure placed directly under them; when turnips sown in the same field, and on the same day, with bone-dust, have entirely escaped their ravages. Their value to the holders of light soils, in thus enabling them to procure the certain means of improving the returns from their land, by this increase of their quantity of nutritive manure, may therefore be considered inappreciable. It has been stated as the comparative result of some experiments, that bone-dust acts in the cultivation of grain, as compared to the best stable manure, in the following proportions:—namely,

In respect to the quality of the corn, as	7 to 5
In respect to the quantity, as	5 to 4
In respect to the durability of its effects on the soil, as	3 to 2*

We cannot indeed agree altogether in this estimate of its powers, but it requires no further arguments to press its application upon the attention of every farmer, who is in possession of ground to which it is suitable. We shall, therefore, only add the following summary of the rules for its application, as recommended by the members of the Doncaster Agricultural Association, from which it appears—

That on dry sands, limestone, chalk, light loams, and peat, bones are a very highly valuable manure.

That they may be applied to grass with great good effect.

That on arable lands, they may be laid on fallow for turnips, or used for any of the subsequent crops.

That the best method of using them, when broad-cast, is previously to mix them up in a compost with earth, dung, or other manures, and let them lie to ferment.

That if used alone, they may either be drilled with the seed, or sown broad-cast.

That bones which have undergone the process of fermentation are decidedly superior, (in their immediate effects) to those which have not done so.

That the quantity should be about twenty bushels of dust, or forty bushels of large, increasing the quantity if the land be impoverished: and, also, according to our opinion, if the bones have been already manufactured.

That upon clays and heavy loams, it does not yet appear that bones will answer.

On this latter observation, however, a farmer near Nantwich, Cheshire, remarks, that he "occupies a farm in the township of Pickmore, the soil of which is a clay loam, scarcely twelve inches deep, the subsoil a grey sand, mixed with coarse clay—which the farmers call *rammel*—on a bed of

*Besides the various modes already in use of drawing oil and spirits from bones and horn, the cotton manufactures in Lancashire are said to have lately used a gluti nous substance, extranted from bones, in the fabrication of the weft of their low priced cloth; and there are now a number of manufactories of this newly-discovered matter.

*N. S. Vol. ii. No. 20. p. 258.

* Repertory of Inventions, No. 86.

good clay marl. Two years ago, he covered the field with bone-manure; previous to which the grass was so sour, as not to be worth ten shillings per acre; but is now full of most excellent herbage, consisting of white clover and trefoil;" to which he adds, that "in another of his fields, with a clay soil, a small portion of it was manured, thirty-two years ago, by a former tenant, with bones, and that, although it has been twenty years in tillage, yet that part still shows a superiority over the rest."*

From the Genesee Farmer.

DURABILITY OF WOOD.

The subject of the durability of different kinds of wood when exposed to the action of air and moisture, though one of great importance to the farmer, and the public at large, does not seem to have received that degree of attention and elucidation it deserves. The Teak tree (*Tectona grandis*) of the East Indies, and the Live Oak (*Quercus virens*) of our southern forests, appear to be nearly indistructable when employed as timber, and in naval architecture. But these from their natures cannot be cultivated in the northern States, and we must seek in our forests trees which shall approach or rival the above in excellence and durability. Fortunately these qualities are found nearly in perfection in the Yellow Locust, (*Robinia pseudacacia,*) and the Red Ceder, (*Juniperus virginiana,*) and in a lesser degree in many others, a knowledge of the comparative durability of which, properly ascertained, would be of essential service to the public.

Thirty-two years since, in enclosing some newly cleared field, we had occasion to set some bar posts, and at a point where four fields cornered we placed one so that it served for four pair of bars, one to each field. The post was the common white ceder, (*Cupressus thuyoides,*) cut from a thrifty tree fourteen inches in diameter, the holes on the four sides cut in the usual manner with a narrow axe, the bark stripped from the whole, and the large end set two feet in the earth, which at that place was rather moist. After standing more than twenty years, or until the basswood fences with which it was connected had rotted down, it was removed to another position, where it has since served for two pair of bars and one gate. At the time of removal it appeared quite sound, and present appearances indicate a duration of another twenty years at least. From our experiments we are convinced that large posts are far more durable than small ones, and that those which occupy the whole diameter of the tree, are better than sawed or quartered trees of equal size.

In the Railroad Journal, in an article on the advantages of lime as a preservation of timber, the following instance of its effect on the durability of the White Pine, (*Pinus abies,*) is given. The planks were a parcel of pine planks used as a platform on the ground, on which to make live morter.—This platform was laid by the informant's grandfather in a corner of the yard, and used every year more or less for the purpose of a mortar bed. His father continued it in the same use; himself, the grandson, continued it for a time, as long as he had occasion, after which it lay some years unused, and overgrown with grass and weeds. At length wanting the ground for another purpose, he had it torn up and removed, expecting to find the planks entirely rotted, but to his surprise found them sound, and, to use his own forcible expression, "as hard as a bull's horn." This was after they had lain exposed to all the vicissitudes of the atmosphere, and in contact with the surface of the earth, about sixty years.

In the year 1800, a Mr. Atkinson, in the employ of the Hudson's Bay Fur Company, discovered on old Factory Island, in James's Bay, a Branch of the Hudson's Bay, a ceder post, about a foot square and five feet high, on which the following inscription had been cut, and all the letters of which were distinctly visible: "In the year 1692 wintered three ships at this Island, with one hundred and twenty-seven men, under the government of Captain Ganes Knight. Then we erected this monument in remembrance of it."

This furnishes the greatest instance of duration of timber set in the earth, and constantly exposed to atmospheric influences, we have any where noticed, and we believe there are few kinds of timber which would endure so long. This notice does not state the kind of ceder employed, but from its frequency on those islands and coasts, there can be no doubt of its being the red ceder, a kind which, as stated above, is almost imperishable.

Next to the kinds above stated, rank in durability the various kinds of pine and spruce; the white oak, chestnut, red elm, black walnut, and red beach; all furnishing timber of good quality, but not such as will, like the above, resist for a long period the attacks of time. In purchasing timber, price should not be so much regarded as quality and durability, as a rail or a post that will last fifty or sixty years, is worth far more than the usual difference charged between such, and those which will endure only twenty-five or thirty.

*New Farmes's Magazine, No. 82, December, 1833.

INTERESTING TO SILK RAISERS.

The subscribers last spring planted a small field with the Morus Multicaulis, or new Chinese mulberry, raised from cuttings of one bud each, say about three inches long, and observing that the trees had grown much larger than he expected, and had also thrown out many side branches, and that the growth was, in every particular, so much larger than was anticipated, he thought a plain statement of facts relative to them, and their culture, might prove encouraging to silk growers, and acceptable to the subscribers of the Farmer and Gardener. He invited his friend E. P. Roberts to ride over to the nursery to see and assist in weighing some of said trees, which he did on the 1st inst. and in his presence three trees were taken up and weighed, the weight of which was 6 3-8 pounds; the average height above ground was 6¼ feet. On measuring a square rood, where those trees grew, the subscriber counted 84 trees, all five feet high and upwards. On separating the leaves from the above three trees, the produce was 2¼ lbs.: now if we say 2¼ lbs. for every three trees, as a portion of them were of a smaller size than those weighed, it will give to each square rood 63 lbs. or per acre 10,080 lbs. of leaves the first season from cuttings—and a large portion of these leaves were produced in time for raising the second crop of worms. The land on which this crop of trees was raised, is a mellow loam on a clay bottom, from which in 1835 it was estimated that I cut two tons of hay to the acre, and was manured last spring with about 22 horse cart loads of barn yard manure to the acre. Planted in rows 4 feet apart and 9 inches in the row. ROBT. SINCLAIR.

Remarks by the Editor of the Farmer and Gardener.

We were delighted at the luxuriant growth of the *Morus Multicaulis* plants mentioned in the communication of friend Sinclair, as well as with their very great yield of foliage. It has satisfied us that much of the objection which has heretofore rested in the minds of those who would reap ere they have sown, against the mulberry culture, may be obviated if the *Morus Multicaulis* be selected for the orchard. All the calculations in our manual are based upon the supposition that the mulberry trees should be 4 years old before they are *picked*,—and in all candor we must confess that we are still of the opinion, that they ought to grow that long before they are deprived of their foliage; for we conceive that defoliation at an earlier period would tend to shorten the life of the plant. But those who are desirous of reaping all themselves, and leaving nothing for posterity, may, if they please, reap the fruits of their labor in the mulberry culture even from the first year upwards,—and now let us see what the product of an acre of ground planted in Morus Multicaulis trees one year old, equal in quality with those of friend Sinclair would yield.

He fixes the quantity of leaves at 10,080 lbs., and as 1,000 lbs. will feed 20,000 silk worms during the working season, so will 10,080 lbs. feed 201,600 worms, and as 3,000 worms will make a pound of silk, so will the aggregate number make 67 1-5 lbs. of silk, which at $4 per pound will bring $283 40—the expense of attending an acre in silk culture, according to our computation, is $154 20; this being taken from the *gross* amount leaves $129 20 as the profit on an acre the first year;—and we fain would ask—what can be put in an acre that will yield so handsome a profit?

The estimated expense of attending an acre in the mulberry and silk culture, assumed by us, we have always considered large, and think so still; but we purposely made it so, in order that we might, in its *excess*, cover all possible contingencies. From some little experience of the last year, we sincerely believe that the expense of gathering leaves and feeding the worms might be lessened at least 33 1-3 per cent. by judicious management, and we are certain that in proportion to the extent of an establishment would the expense be reduced.

Joseph W. Patterson, Esq., has been unanimously elected President of the Baltimore and Ohio Railroad Company. The Baltimore Gazette says this vote of the stockholders of that Company, will meet the general approbation of the citizens.

WEBSTER'S OTAPHONE; OR, PATENT INVENTION FOR ASSISTING THE HEARING.

The inventor was first led to a consideration of this subject by a sensible diminution of the powers of hearing in himself; and observing the general prevalence of this calamity, and also a mode as generally adopted, of applying the hollow of the hand to the back of the ear to increase the sound, he was induced to consider, whether the assistance this practice afforded, might not be obtained by means less troublesome and unsightly. With this view, the instrument he has termed an otaphone was first constructed; and its efficiency having exceeded his expectation, and led to the discovery of further benefits resulting from its use, he hopes that a narration of the principles on which it acts, will induce those who are subjected to the depressing sensation of partial deafness, to avail themselves of it.

The shape of the outward ear generally escapes observation, but if once the attention is directed to it, it will be found to vary in a greater degree than any other organ; and as it is the outwork to the sense of hearing, the recipient from which all the subsequent changes sound undergoes, proceeds, its figure becomes a matter of important consideration, and it is also deserving of remark, whether it always presented the same external appearance.

On inspection of that splendid collection of statuary, forming the gallery of Egyptian antiquities in the British Museum, it will be seen that, in almost every specimen, the ear is represented to have borne, in that remote age, a larger proportion to the head than at present; while in the Grecian and Roman sculpture, produced, probably, at an interval of 1000 years, it in no instance essentially differs from the most elegant proportions amongst ourselves, except in its greater prominence. The angle formed by the helix, or outer margin of the ear, and the temporal bone, varies in these statues from twenty to thirty degrees; and in the female heads, where it is more delicately constructed, a similar projection is observable.

This difference in its development is the more important, if we consider the very peculiar nature of its structure. Being formed of a substance harder than flesh, which would absorb the sound, and softer than bone, from which it would reverberate; having also such irregularities on its surface as collect the vibrations of air in every direction, and convey them to one general receptacle, it becomes apparent that any diminution of its natural expansion must be greatly prejudicial to the purpose for which it seems so wonderfully constructed; a deduction further confirmed by the fact, that those who possess the most perfect and shell-like form of ear, have the sense of hearing in the greatest perfection.

The original shape is still preserved by eastern nations; but the climate we inhabit requiring some covering for the head, both by day and night, has greatly tended to alter its form, and certain notions of taste have induced parents to press it to the head as closely as possible.

This organ seems also to have suffered in another respect, having no longer any voluntary power of motion; a faculty possessed by the Arabs and other nations approaching nearest to the primitive state of existence, but which long civilization has rendered of less importance to us, and time has nearly obliterated. This adaption of the ears to the direction whence sounds proceed, must greatly increase our auditory perception, and accounts for the wonderful acuteness of hearing possessed by savages. Instances of its existence occasionally occur among ourselves; a most eminent anatomist having favored the inventor with references to two individuals, who, within the last twelve months, have consulted him, having "a voluntary power over the muscles of the external ear;" and every practitioner of long standing must have witnessed similar cases.

Sir Charles Bell, in the following extract from his work on the "Anatomy and Physiology of the Human Body," thus speaks of it:—"In most men the motion of the ear is lost, but some still retain it; and this is very remarkable,—that when the more internal mechanism of the ear is injured, and ceases to strengthen the sound before it conveys it inwards to the labyrinth, the external ear resumes the office *to which it was originally adapted*, and by a degree of motion and erection assists the hearing."

Having thus established both an alteration in the form, and a loss of power in the use of this important organ, it seemed desirable that the projected instrument should not only accomplish the occasional service at first contemplated, but also attempt some remedy to counteract these permanent disadvantages. For this double purpose the otaphones are now constructed. They are formed from a correct model of the back of the ear, and by fitting all the irregularities of that very uneven and elastic surface, gently press forward the parts so as to produce a more perfect orbit, and fuller recipient of sound; and being self supported, they occasion no inconvenience to the wearer.—By thus concentrating all the powers that nature has provided, a considerable addition to the ordinary force of sound is obtained; dissipating dullness of hearing, when not arising from internal injury, and enabling those in whom this sense is perfect, to preserve the same advantage at a much greater distance. They will, therefore, be found particularly useful in places of public worship, courts of law, the Houses of Parliament, theatres, and wherever the ordinary powers are insufficient; and by bringing the focus of sound into a more direct line with the face, the expression of the speaker is better preserved than by the unassisted ear.

It is, however, on the advantages they permanently confer, when their use is discontinued, or very rarely resorted to, that the inventor places his greatest reliance for their general adoption. Though obtuseness of hearing arises from many causes, one of the most frequent is the insufficient quantity of sound the external ear collects. When this is the case, the membrane of the tympanum, or drum of the ear, and the internal organs which depend on its vibration for their active employment, become relaxed, and contract the same degree of feebleness as would attach to any other part deprived of its natural action; and this inertness, or stagnation of their powers, renders them unable to surmount those occasional injuries that blows, colds, fever, &c. create; and thus, from the most common accidents, a permanent injury to the sense is induced, which a more active state of the parts would frequently remove. Ear-trumpets, which are generally employed to remedy this defect, often convey a sound painfully acute; and instead of bringing this organ, by gentle changes, to a degree of tension to which it might become equal, they commence with a force, derived from metallic surfaces, which impairs its elasticity, and requires the continuance of the same, or a greater power, to preserve any sensation whatever.

The ear therefore seems to require a degree of exercise proportioned to its capacity, but not exceeding it; and the prevalence of defective hearing leads to the presumption, that a greater nicety is requisite to attain this end, than any artificial means hitherto discovered have afforded. The otaphones are based upon the principle, of proportioning their assistance within the limits apparently asssigned by nature. The alteration they occasion when worn, is but a restoration of the ear to its original and most useful shape; and for all their subsequent advantages, they depend on that peculiar fabric before described, and which is so happily adapted to the purpose, that no other substance can supply its place. They will, therefore, be found equal to the perfect restoration of the hearing, if any increase of sound, however trifling, is perceptible on their first application, and generally the use for an hour each morning, for a short time, is sufficient; but if the impediment has been of long continuance, and no advantage on trial is experienced, their employment, without previous preparation, will not be recommended.

In conclusion, it is to be remarked, that as the defect these instruments profess to remedy, arises from insufficient action, and not from over exertion, they are applicable at every period of life; while those whose hearing is unimpaired, but desire to hear as well at a greater distance, will at once perceive the advantages they are capable of affording, by the louder sound of their own voices.

W.

102 New Bond-street.

WATER OF THE ELTON, DEAD, AND CASPIAN SEAS.*—The Elton sea lies to the east of the Volga, 274 versts (181¼ miles,) south from Saratov. Its greatest diameter, from east to west, is 17 (11¼ miles,) and its smallest diameter 13 versts, (8½ miles.) The specific gravity of the water, at 53½°, is 1.27288, according to Rose. Its contents are, according to Rose and Erdmann:—

	ROSE.	ERDMANN.
Chloride of sodium,	38.3	71.35
Chloride of potassium,	2.3	
Chloride of magnesium,	197.5	165.39
Sulphate of magnesia,	53.2	18.58
Sulphate of lime,		.36
Sulphate of soda,		3.84
Carbonate of magnesia,		.38
Water and organic matter,	708.7	740.10
	1000.0	1000.00

When the temperature of the sea falls, Epsom salt precipitates. Here it is evident that the specific gravity and composition must change with the temperature. The shore of the Elton sea exhibits, in summer, crystals of gypsum and common salt; and, in winter, besides these, Epsom salt, which, in summer, is again dissolved, so that pure common salt may be obtained here. In the cool summer nights, according to Pallas, Epsom salt is deposited, and is again dissolved during the day. The greater the quantity of chloride of magnesium and Epsom salt, so much the less is there of common salt; which, from the elevation of the temperature, dissolves in no greater quantity in the same. Hence, the reason for the small quantity of common salt which Rose

* Poggendorff's Annalen xxxv. 169.

obtained. When an analysis of such a saturated water is given, it is absolutely necessary to give the specific gravity and the temperature. The reasons given are sufficient to account for the difference in the two analysis.

Erdmann found the constituents of the Bogden sea,

Sulphate of lime,	.74
Sulphate of magnesia,	10.30
Sulphate of soda,	215.76
Muriate of lime,	8.85
Muriate of magnesia,	48.53
Water,	715.72
	1000.00

The water of the Elton sea resembles that of the Dead sea, but the latter has a less specific gravity, and a smaller quantity of solid constituents. The quantity of salt diminishes when the Jordan is overflowed. Gay Lussac allowed the water to cool to 19° F. without separating any salt; while Klaproth states, that at the bottom of the flask which contained the specimen which he examined, crystals of common salt were deposited, which soon disappeared The specific gravity of the Dead sea varies, and the reason is obvious. Macquer, Lavoisier, and Sage found it 1.240; Marcet and Tennant 1.211; Klaproth 1.245; Gay Lussac at 62°.6, 1.2283; Hermbstadt at 60° 1.240. The proportion of ingredients also varies. Gay Lussac found them 26.24 per cent.; consisting of chlorides of sodium, calcium, magnesium, and potassium, and traces of gypsum, differing from that of the Elton sea by the absence of Epsom salt, and the presence of chloride of calcium,

According to Marcet, the specific gravity of the water of the sea of Urmia is 1.16507, and its constituents 22.3 per cent. consisting of common salt, Epsom salt, and sulphate of soda. The saline contents of Urmia and the Dead sea are, therefore, inferior, to those of the Elton sea. Rose has appropriated all the sulphuric acid to the magnesia, because he has found that when common salt and Epsom salt are dissolved in a sufficient quantity of water and evaporated in a summer heat, the two salts separate; and when much common salt is dissolved along with a small quantity of Epsom salt, a part of the common salt separates first, and then the Epsom salt, while common salt remains in solution; as by the heat of summer, Epson salt is less soluble than common salt. When the temperature is raised above 122° F. or sunk to zero, in both cases, glauber salt and chloride of magnesium are formed.

Rose found the specific gravity of water brought from the Caspian sea 75 versts from the islands formed by the Volga, at 54½°. 1.0013; and its contents.

Chloride of sodium,	.754
Sulphate of soda,	.036
Sulphate of lime,	.406
Bicarbonate of lime,	.018
Bicarbonate of magnesia,	.440
Water with a small quantity of organic matter,	99.348
	1000.000

[Record Gen. Sc. February.]

The ludicrous effect produced on a body of armed Mexicans who beheld for the first time the movements of a steamboat, is thus described by one of their officers.

At the time of the Texian campaign General Goana, from the interior province of Guanajuato while on the banks of the Brassos with his troops ordered seven of his men, who could swim, to go into the water, and *stop a steamboat*, filled with Texan soldiers, which was approaching at the rate of ten or twelve miles an hour! But as she came roaring on, sending forth columns of smoke, with her sides barricaded with cotton bales, not only did the selected seven retreat, but the whole force—eight hundred men—stood appalled at the "serpent of fire," as they thought her. When opposite the valiant army, the engineer let off a terrific blast of steam, and the cavalry wheeled and fled. The infantry broke their lines, dropped their muskets, and followed in the retreat, and the steamboat was miles away before the soldiery could be rallied to fire a gun. Indeed it was with the utmost difficulty they could be prevailed upon to approach the banks of the river at all, and when they did so it was with fear and trembling.

REPORT ON MR. PRUTZMAN'S LEVER LOCK AND KEY.

The Committee on Science and Arts, constituted by the Franklin Institute of the State of Pennsylvania for the promotion of the Mechanic Arts, to whom was referred for examination, the Lever Lock and Key, invented by Mr. Prutzman of Philadelphia, report:—

That they have examined the the lock and key and find it to be a specimen of both *ingenuity and workmanship.*

The main feature in the lock is the manner of securing the bolt, so as to prevent its being operated on by means of a *pick*, and to prevent a key being fitted to it unless in detached parts. The lock is arranged with tumblers working vertically, and horizontally, so as to secure the bolt in its position, when locked or unlocked. The tumblers are operated on by means of a lever inserted in the bit of the key, and working on a centre. This lever is put in motion by a plate so arranged in the lock, as to pass into one of the wards of the key, and press the lever towards the barrel or stem. One end of this lever acts on a projection raised on one of the tumblers, causing it to descend, whilst a portion of the key acts on a parallel tumbler, causing it to ascend, the opposite end of the lever acts on a horizontal tumbler, and thereby relieves the bolt. When the bolt is shut the tumblers resume their former position and secure it in its place. A lever is placed between the two parallel tumblers and working on a centre, the bolt is secured at one end and moved by means of a key at the other, causing the bolt to move in an opposite direction to that of the key.

The general arrangement of the lock is simple and good, and we may add the best that is within the knowledge of the Committee. From the common key an impression may be taken so as to form a duplicate, but from the present arrangement of a key, with a lever inserted, it will not be practicable, owing to the great accuracy required in the formation of the lever.

Mr. Prutzman deserves a great deal of credit for his *ingenuity*. The Committee understand that several of the locks are at present in use; one in the banking house of the U. S. Bank, and others in the city of Baltimore. The Committee recommend it to the public, particularly to Bank directors.

By order of the Committee.

WILLIAM HAMILTON, Actuary.

May 12, 1836.

RATIONALE OF COLD PRODUCED BY SULPHATE OF SODA AND MURIATIC ACID.

—Dr. Kane makes the following statement in a paper on the action of muriatic acid on the sulphates. "It has been long known that Glauber's salt treated with muriatic acid constitutes a powerful freezing mixture, the theory of which is at once explained by the results of the experiment. When sulphate of soda is dissolved in muriatic acid there are formed bisulphate of soda and chloride of sodium, and as the former salt crystalizes with only four atoms of water, the remaining quantity of the water of crystalization of the Glauber's salt, is disengaged to the amount of sixteen atoms." "This large quantity of water suddenly separated from a state of combination in which it had been solid, produces by its absorption of caloric. of liquidity the frigorific property."—[Lond and Edin. Philos. Mag. May.]

ABSORPTION OF LIGHT BY NITROUS ACID GAS.

Sir David Brewster has found that hea so modifies the absorptive power of this gas for the different colored rays, that while at ordinary temperatures it has an orange color, by raising the heat it becomes red, and finally black, not a ray of any color penetrating it. This gas produces in a spectrum formed from artificial light, dark bands analagous to those exhibited by the solar spectrum. By improving the arrangements and method of observation originally devised by Fraunhofer, of Munich, Brewster has succeeded in detecting two thousand easily recognized portions of the spectrum, separated by thin dark lines, resulting from the absorption of specific rays.

Apparent irregularities in the dark bands of the solar spectrum, were traced to the greater or less proximity of the sun to the horizon, the effect being greatest when the sun sinks below the horizon.

Sir David Brewster infers from a comparison of the lines in the solar spectrum with those produced in the spectrum from artificial light by nitrous acid gas, that the same absorptive elements which exist in the atmospheres of the sun and of the earth.

Liquid nitrous acid produces none of the fixed lines above alluded to.—[Abstract from Lond. and Edin. Philos. Mag., May.]

MINERAL MANURES.

Application of Marl.

(Continued from p. 309.)

In the earliest stages of improvement in the Norfolk husbandry, some farmers, from experiencing the evils of a want of firmness in their poor sands, marled at the rate of 120 to 150 cubical yards per acre; the consequence of which was what they call *setting*: the firmness was produced, but at the expense of the friability of the soil, which was thus rendered too tenacious, so that it is at present found preferable to give a moderate dose at first, and to repeat it at a future period. This prejudicial effect, arising from marl, is very remarkable; for the clay, sand, and lime of which it is composed would not, if thrown promiscuously over a field, produce the same effects; and when laid upon the land, they indicate no improper proportions, nor any which are not found in very rich soils. It may, therefore, contain other ingredients which have not been detected by chemists; and, as has been imagined—perhaps not unjustly—by Arthur Young, "it arises from the addition not being so well assimilated with the sand, as in soils of a natural texture it is rather a mixture than an incorporation."* There is, indeed, reason to suppose that marl derives much of its beneficial qualities, as a manure, rather from the complete amalgamation of the various substances of which it is composed, than from any other cause.

Mr. Marshall, in his Rural Economy of Norfolk, enters into a chemical investigation of the nature of the marls, which, though too long for insertion here, is well worthy of attention; in which he describes that of the white, or rather yellow kind, as one of the best and most lasting species of fossil manures. Twelve cart-loads—according to his account—change the nature of the land in the second year after it is laid on; and most of the exhausting weeds which impoverish the soil, and choke the corn in its infancy, being effectually destroyed, it consequently has a great tendency to keep the land clean; also bracing the pores of the earth, and increasing its fertility to a surprising degree. Its benefits, he says, are felt throughout full thirty years; when a second marling of about half the original quantity may with propriety be used; but it has been found, by experience, that it does better the secone time, if applied as a compost with earth of a sort different from that of the soil on which it is laid; or with mud, and more especially with dung. To this it may also be observed, that lime is not unfrequently added: though, as lime and marl both partake of the same properties, the mixture of the former only has the effect of strengthening the compound.

It thus appears that not only do the species of marl vary in several parts of the kingdom, but in some parts there are kind which, though seemingly quite distinct from each other, have yet been found, on trial, to possess precisely similar qualities; for we learn that experiments on a considerable scale have been tried in the New Forest, in Hampshire, on three different sorts, dug out of the same pit, namely,—yellow, at about four feet below the surface, blue in the middle, and shelly-marl underneath; and yet, although from all the accounts which have been received of the latter, its properties are superior to those of the two former, still, in these instances, no other difference was observable in the crops during many years, except that the shell-marl rendered the land rather the most friable.*

That marl materially benefits land on which it is judiciously used, admits of no kind of doubt. Much difference of opinion is, however, entertained respecting the manner in which it operates—most farmers conceiving that its only value consists in the calcareous matter with which it is combined; others, that its principal advantage arises from the bulk and consistency which it imparts to the ground; and some, that the improvemement which it occasions is chiefly owing to its mechanical action on the texture of the soil. Upon an attentive consideration of the subject, it will, however, appear, that a certain portion of its utility as a manure is derived from each of the three sources which have been assigned. With regard to calcareous earth of which it is partly composed, it clearly possesses, in extent equal to the proportion which it contains of that substance, the same power that would be produced by the direct application of a similar quantity of lime. It is, however, apparent that some descriptions of marl, though advantageously employed on most soils, do not contain any, or only a very small portion of the carbonate of lime; its efficacy therefore cannot be solely attributable to that cause,† and it must possess some other property from which its influence upon the land is partly derived.—This may consist either in the change which its application produces in the texture of the ground through the mere increase of its bulk, which by its dense and unctuous quality, also adds to the consistence and value of all light soils; or, by the more perfect combination of the particles of which it is formed, by which its powers are brought into full action, and lime, sand, and clay are each made to bear against each other, and thus aid its mechanical operations on the land. All marl, except those species which are combined with large portions of iron, sulphur, or deleterous mineral substances, also of itself affords nourishment to corn and vegetables; it must, therefore, be considered as a soil, and when laid upon the land this addition must necessarily yield a more abundant support to succeeding crops.

If this view of the subject be correct, it may be assumed, that all kinds of marl which abound in calcareous matter may be considered applicable to every soil to which lime is beneficial; subject, however, to the effect which may be also produced by the other portions of their substance when applied to land of a peculiar nature. Thus—as we have already more fully stated in the preceding part of our observations—on light, sandy, and gravelly soils, an advantage is gained by the large quantity of clay which the marl appropriate to such land usually contains, by rendering them more stiff and impervious to the rain, and therefore stronger: on wet and heavy lands, on the contrary, as it renders the soil more retentive, unless very great care be bestowed on their drainage, it may occasion permanent injury; but shell and stone-marl occasion it to become loose and friable. Attention should therefore be paid, not only to the nature of the marl, but to that also of the soil to which it is to be applied; and when a choice of marl can be procured, its earthy portion should differ as widely as possible from that of the ground upon which it is intended to be laid.

In fine, marl may be considered as an improver of the soil under so many different circumstances, that it can hardly be recommended in too strong terms; for if it be used with judgment, it adds staple to the soil, improves its quality, and renders the application of putrescent manure more effectual. The use which some farmers make of it, however, deserves the highest censure,—many of them taking repeated crops of oats in the interval of one summer-farrow for wheat, by way of cleansing the land; after which, barley and oats again, as long as the land will produce anything, until it is at last laid down with weeds and couch-grass. Such is the view taken of their conduct by the surveyor of Lancashire, where it is very extensively employed, and in which opinion he is by no means singular. The rotation which he recommends—with reference, of course, to land that is not too strong—is to take one crop of oats the spring subsequent to marling; plough the stubble immediately, in order to expose the marl again to the influence of the frost; fallow, with manure, for turnips—a crop which, under this management, is never known to fail; then barley, clover, wheat, turnips fed off with sheep, and barley again, with well-dressed hay seeds, and white clover and trefoil for a perennial ley, or at least for some years*. Under which management, poor land may, when properly tilled and duly supplied with putrescent manure, be rendered highly exuberant without being in the least degree harassed.

Analysis of Marl.

The value of marl, as a manure, must of course be referable to the nature of the different kinds employed. It is, indeed, evident that, being intended to correct or im-

* Papers of the Bath Agricultural Society, vol. x. p 108.

* Communications to the Board of Agriculture, vol. vi. art. 3.

† Out of twelve specimens of marl submitted to the inspection of Sir Humphrey Davy, eleven were found to contain calcareous earth in various proportions; but the result of many other trials of marls, procured from different parts of the country, and found by farmers to produce an amelioration effect upon the land, yet proves them to be, in many instances, wholly deficient in that substance. See the section on "Marl," in Holland's Survey of Cheshire.

* Dickson's Lancashire, Stevenson's edit., p. 491.

prove the soil, its constituent parts should be known, and their qualities explained, before any use can be rationally made of it; and, therefore, the more accurately its properties are ascertained, the more confidently may the propriety of its application be determined. Farmers, indeed, cannot be expected to be sufficiently acquainted with chemistry to be able to analyze it, though the most calcareous sorts may be known by means of acids, as applied to lime; or, the common earthy kind, when put into water, will fall to pieces, allowing a considerable portion of sand to fall to the bottom of the vessel: by which simple tests, they might often derive considerable advantage. Its qualities are, however, more generally taken, by mere practical men, more upon trust derived from the experience of their neighbors than from any actual knowledge of its properties; but although, when thus guided, they cannot go far wrong, yet they may be misled by circumstances of slight apparent difference, and, in cases of new pits being opened, no certain estimate of its effect can be formed until a complete analysis has been made. This should, indeed, be done in all such instances; for it costs but a trifle, is easily performed, and without having recourse for the purpose to a regular scientific chemist, the object may be attained by application to any intelligent apothecary, by furnishing him with the following account of the modes of procedure:—

The ingredient of marls, on which their fitness for agricultural purposes depends, is the carbonate of lime. It is owing to the presence of this earth that marls effervesce on the addition of acid, which is one of the irdistinguishing characters: to ascertain which—

'Let the marl be put into a glass partly filled with water, which will expel a portion of air contained mechanically in the marl, and thus obviate one source of fallacy.—When the marl is thoroughly penetrated by the water, add a little muriatic acid, or spirit of salt. If a discharge of air should ensue, the marly nature of the earth will be sufficiently established.'

Then, to find their composition—

'Pour a few ounces of diluted muriatic acid into a Florence flask, place them in a scale, and let them be balanced. Then reduce a few ounces of dried marl into powder, and let this powder be carefully and gradually thrown into the flask, until, after repeated additions, no further effervescence is perceived. Let the remainder of the powdered marl be weighed, by which the quantity projected will be known. Let the balance be then restored. The difference of weight between the quantity projected, and that requisite to restore the balance, will show the weight of the air lost during the effervescence, and will stand thus,—

'If the loss amount to 13 *per cent.* of the quantity of marl projected, or from 13 to 32 *per cent.* the marl assayed is calcareous marl, or rich calcareous earth.

'Clayey marls, or those in which the argillaceous ingredient prevails, lose only 8 or 10 *per cent.* of their weight by this treatment; and sandy marls about the same proportion. The presence of much argillaceous earth may be judged by drying the marl after being washed with spirit of salt, when it will harden, and form a brick*.

Though it is well known that Mr. Pedder has returned from Europe, we cannot but give the following letter and information as a preparation for his recent work.

From the Boston Commercial Herald.

BEET SUGAR.—The immense benefits to be expected from introducing the Sugar Beet into the United States, had for a considerable time occupied the attention of James Ronaldson, Esq.; when in the month of January last he was introduced to Mr. James Pedder, a gentleman who possessed information on the subject of the Sugar Beet. Mr. Pedder had been long known to John Vaughan, Esq., who, with Mr. Jacob Snider, Jun, now took a lively interest in the concern, and after several interviews it was determined to despatch Mr. Pedder to France, with the view of obtaining accurate information on all subjects, connected with the culture of Beet and the uses to which it is applied. The responsibility and expense of this undertaking were assumed by Messrs. Ronaldson, Vaughan and Snider, in the confident belief that they would be sustained by their countrymen in this laudable undertaking. It was important that Mr. Pedder should be despatched immediately in order to witness the process of making Sugar in France, and to send out seed in time to be planted in the United States the present season. Mr. Pedder left Philadelphia on the 8th day of February, and his mission has been attended with the most gratifying success, nearly 600 lbs. of seed having already been received and portions of it distributed through various parts of the country. Several patriotic individuals have made contributions towards defraying the expenses of this undertaking, in sums of from ten to fifty dollars each. But the amount yet received is inadequate to the expenditure. An association has been formed of which Mr. James Ronaldson is President, John Vaughan, Vice President, and Jacob Snider Jun. Secretary and Treasurer. The object of this society is to collect and disseminate information for the benefit of the community generally without any view to pecuniary emolument. Further contributions in aid of this object are respectfully solicited, and will be received by the following named gentlemen:

JAS. RONALDSON, Esq. President, corner of 9th and Shippen sts.,
JOHN VAUGHAN, Esq. Vice President, 32 Walnut street,
JACOB SNIDER, Jun. Treasurer, and Secretary do.

Managers.

Samuel Richards, Esq., Arch, above 9th,
Nathan Dunn, Esq., Portico Row,
Joseph D. Brown, Esq., Church Alley,
Isaac S. Lloyd, Esq, Penn Square,
Samuel Breck, Esq.,
J. S. Lovering, Esq. Church Alley,
B. M. Hollinshead, Esq., No. 14 North 6th street,
Joseph Sill, Esq, Chesnut-st, opposite State House,
John Richardson Esq., 10th, near Arch-st.
James Wood, Esq.,
Frederick Brown, Esq., 5th and Chesnut street.
Geo. Zantzinger, Esq., 25 Dock street.

As an increased interest is being manifested on this subject, we have solicited and obtained from Mr. Snider, Treasurer and Secretary of the "Beet Sugar Society," extracts from various letters received by him from James Pedder, Esq. the agent of the society, who is now in France seeking information relating to the Beet root, and manufacture of sugar. According to our notice on Saturday, we now give the extracts.

BOULOGNE, March 11, 1836.

"I begin by saying, if in such a climate, with such a very inferior kind of Beet, the common Mangel Wurtzel, of all colors, hollow and half rotton, they are able to obtain nine per cent. of Saccharine, America is a gold mine. The crushing mill is driven by five bullocks in harness, the roots are pressed towards a revolving barrel, set with teeth and the pulp falls into a box below,—a boy takes about a gallon of this pulp and puts it into a bag which is then thrown on a wicker frame work which rests on a small wagon. This is continued until fifteen or twenty bags are heaped on the wagon; the top being covered by a wicker frame; these are placed under the press and an exhausting pump set to work the juice is extracted in about two minutes, which is conveyed by troughs to a large cistern, and from thence it is let off into a range of evaporating pans made of copper which work by steam.

* * * * *

I here saw many very fine oxen fatting upon the dry cake of the Beet, sleek and fat as butter, and which I did not expect, some hundreds of *sheep* fed with the same in troughs and confined to the house, many of them very fat, and all looking extremely well; they had all been shorn and their fleeces turned into money. Some of these would weigh 16 lb. a 18 lb. per quarter, a large size for French sheep. * *

What I write will always be the dictation of my firm conviction *at the time I write:* I may have cause to change my opinions as I go on, which I ought to have no objection to do, and which I will candidly acknowledge.

* * * *

The exertions making in France and throughout Germany to simplify the process of preparing sugar from the Beet are immense and increasing. At the recent meeting of the German Naturalists at Boun, the section of agriculture and rural economy was almost entirely occupied with papers and discussions on the subject. At Valenciennes a manufacturer has succeeded in discovering a method of crystallizing the saccharine matter without producing molasses.

ARRAS, Saturday, March 25th, 1836.

J. SNIDER, JR. ESQ.

Dear Sir:—I have been most unexpectedly introduced to Professor—— who is here on a mission from the government of Prussia to learn the best mode of transplanting the sugar manufacture into that country. He is accompanied by a draughtsman, a student from the Royal College of Arts; and they are two of the most charming people I ever met. I shall obtain information which money could not purchase, and which will be inestimable; it will be the result of theory and experience which they have been acquiring at great expense on this their tour of observation and which will secure for

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*Henrys' Elem. of Exper. Chem., vol. ii chap. xv. sect. iii. See also Kirwan on Manures, p. 12.

us the most complete success. But here I must admit that much of the *poetry* with which the culture and manufacture of Beet sugar has been embellished has *gone out* I can no longer see that it will almost prepare itself for use and drop in crystals into our coffee, but I have instead of this poetical fiction, the most perfect conviction of complete success in our object, based on common sense and the experience of every day's occurrence which far more than balances what has been lost: for this well grounded hope I am mainly indebted to the Professor, whose convictions as to the certainty of the process and the profit of the undertaking are completed by what he has witnessed at an establishment here, to which I have access by means of a letter from J. B. and where I met with him and his intelligent friend. I have now their ground for my proceeding. When I showed the Professor the different accounts which had been published, especially one at Westphalia, which shows, *almost*, that the sugar will form of itself, let but the ingredients be brought into contact with each other, he smiled and said he knew how to value these accounts; they proceeded in a great measure from the real facility with which sugar might be prepared by the best means now in use in this part of the country, and which is truly astonishing to those who have seriously gone into the examination of the thing; he has given me to understand that I must not expect to find the refining process connected with the absolute formation of the sugar; *that* he says is not necessary or desirable "let but a man be able to make on the same premises 6 or 7 hogsheads of good crystallized sugar, 3 or 4 hogsheads of molasses for fattening bullocks and sheep, in addition to 15 *lbs. of the expressed cake to mix with them, and if he is not content, why then let him go to *vapour hunting*."

The next and most important manufactory in the world is situated in this town; I have visited it three times in company with the Professor: it belongs to a Mr. —— the most intelligent man I have met by far. He was engaged in the manufacture of sugar from the Beet in the time of Buonaparte and Chaptal, has continued it ever since, and has lately adopted a mode for himself which bids fair to obtain in the end universal *adoption*: this was the work which a gentleman at Paris said I should not be allowed to see and study without an expense of 15,000f. To this noble establishment I have free access by means of a letter from my friend J. B.; but I find it quite impossible to go into a full description of all its parts. Seventy-four men and women are employed here every day, and about ten less during every night. The works consume the steam of 120 horse power, crushing tons of Beets and evaporating the juice and crystallizing the sugar complete in 24 hours. From the washing of the roots to the pouring of the juice into crystallizing pans is only the work of 10 hours, the process being seven, consisting of washing, rasping, pressing, defficating, clarifying, and two evaporatings, in the most simple and perfect manner imaginable, all of which I shall be quite competent to on my return. Mr. —— has invented a most complete set of implements for the cultivation of a crop; *a drill that is perfect*, to sow three rows, or five if preferred, with hoes, &c. of the most simple and effective kinds; by these he is enabled to cultivate several thousands of acres of land in various parts of the country, his largest farm being 4 miles distant from hence, where I have seen his stock of oxen, sheep, and milch cows and farming horses, all fed on the cake and refuse of the sugar house, and cut chaff to wonderful profit. The cake which they are now using is six months old, preserved in magazines of which I have a plan, where it remains perfectly sweet for nine months of the year. It cuts out quite hard and is perfectly vinous in the smell. Mr. C. at this and his other works prepared in 1835, two millions and thirty thousand pounds of sugar, and expects next year to make *three millions* the whole expense of fabrication, including rent of premises, wear and tear of machinery, interest of capital &c. has been 4 4-7 sous per lb. This man ought to know his business—he says he has made thousands of experiments, has seen all, and tried many, of others, and from these has adopted his present plan as the result. The professor is so satisfied that he has told me when I hear that Mr. C. has adopted some new mode, I will believe that it is better than what he at present uses; all other accounts of improvements &c. will go with me for nothing. I should say Mr. C. has seven works. His kindness to me has been remarkable, I dine with him to-morrow in company with the Professor and his friend. I have many results and calculations made here which have been given me by the Professor, (who has spent twelve days at the works) which I could not have obtained for any money, but which I am confident have cost him a large sum. Mr. C. ridicules the idea of making refined sugar at the same establishment at the same time, according to the poetry of the times. He thinks to produce good brown sugar is quite sufficient for one man and one process and ought else would impede. Hisseiam engines is 9 horse power, 111 horse power then goes to evaporate, heat drying rooms, &c. Now the process of the manufacture of sugar as well as the proper cultivation of the plant, I shall I feel be fully competent to.

I wish to be enabled to expend a small sum in procuring models of some and information on others, which I shall not find myself competent to until I hear from you. It seems as though things were determined to turn out to my advantage. When the real authors of all the success in Sugar making first come here, they brought with them a young man as Engineer; he is in this town the head of an immense establishment for the preparation of machinery for the Sugar business, and to him I have been introduced by the kindness of another gentleman, to whom I brought letters from Paris; on my deploring the cost of the machinery in present use, he showed me the drawings of a set of his own invention. for which he is about to take a patent; he will be prepared to describe them fully to me in a short time when I shall immediately communicate to you the result.

I find that the seed which I have sent you is of the true Sugar kind; pray get it all sown and request that it may be kept quite clear, that we may do ample justice to this our first essay. The roots grew large upon land of first quality, a fine deep red loam; I shall be able to introduce a system of management which is truly excellent. Here is a saying, "the Beet culture is at the foundation of all good husbandry," and so it is; the best crops in the country are raised after one, two, three, and even four crops of Beet, which are not dunged for generally.—They do not exhaust the soil, but their autumns are terribly against them in taking up and housing, compelling them to leave them in the fields in pits where they are not protected by any thing but a covering of earth from the winter's rains. Fifty pounds of the cake mixed with one lb. of oil cake* are sufficient for the keep of ten sheep for a day, given to them at twice, so that 100 lbs of Beets, value 25 cts., give 6 lbs. Sugar, 4 lbs. Molasses, and 25 lbs. Cake, and sufficient food for fatting 5 large sheep per day.

ARRAS, April 4, 1836.

DEAR SIR—Pardon me if I tease you with my frequent letters, but the fact is, I *hear* so much of Beet Sugar, I *see* so much of Beet Sugar, and *eat* so much of Beet Sugar that you must not wonder if I return to you in the shape of a *Marmalade*. I believe I told you in my last letter that I was setting off for Lisle, Valenciennes and neighborhoods; my main object was to ascertain where was the best system of Sugar making practised that I might be able by observation to know which to prefer; but I had another end in view, namely: to find out where it was that refined sugar, loaf sugar, was made from the Beet by a single process: every one *who knew nothing of the matter* assured me it was done somewhere, while all the manufacturers declared the thing was impossible; still I was determined *if possible* to hunt it up, and at Famars, in the neighborhood of Valancies, I found a very large manufacturer who was absolutely making beautifully white sugar from the Beet, by a simple process; and although he is selling it at a price two cents only below the refined sugar, yet it is, after all, *powdered sugar*, and by no means loaf sugar; when I told him what I had been led to expect, he declared the thing to be impossible, by no means to be desired, and totally incompatible with the profitable preparation of sugar in the brown state, which requires the most incessant care and circumspection while in process, and is of a magnitude sufficient to engross all the time and talent of the most industrious. I have therefore, been pursuing an *Ignis*, but not a *fatuus*, for I have added exceedingly to my knowledge and experience, but not one jot to the conviction which I before entertained, of the facility with which sugar from the Beet might be prepared to any extent; I am therefore returned to Arras to study the art at the finest establishment in France, and where they have a sufficient quantity of the roots remaining for another week's crushing—I hope more. At Valenciennes and the neighborhood there were, three years ago, thirteen sugar manufactories; now, there are sixty-four! Land which was worth 500f. an arpent will now bring 1200, labor has very much risen, and never, in any country did I witness such excellent farming. The residuum from the sugar houses is extremely rich, as a manure, and this, they are now spreading on their young crops of clover, which are prodigiously flourishing; they do not manure for the Beet, but for the preceding crop. and one half the expense of hoeing and cleaning the Beet is charged to the following crop, which is so much benefitted by the operations.—The drill which they use, Crespels, sowing 8 lbs. of seed to the acre, is a most valuable instrument for the lands in America. At a manufactory in Valenciennes, conducted by a farmer, who is also a Brewer, a wine merchant and a distiller, I saw some very good machinery, which crushes 50,000 lbs. of Beet in 24 hours; at another they crush

*In those proportions.

*From the white poppy.

70,000 lbs. while a third crushes 75,000 lbs evaporating all the juice and crystalizing all the sugar therefrom in 16 hours only. 10 lbs. of Beet yield 85 pounds of juice. The brewer purchases beet root for 1 franc per 100 lbs., and sells the pressed cake, for oxen and sheep at 5 cents per basket, about half a bushel: on the other side of Valenciennes, at the distance of a few miles, I was introduced to a person whose premises are enormously large, I saw, in one stable 50 large plowing horses, 7 saddle horses in another stable, 30 fatting oxen, which have nothing but the cake and straw, to feed on, and two of the largest oxen I have seen for many years, finishing off with cake mixed with oil cake, a most capital food; his sheep were feeding on the cake, but they were a breeding flock; his beet roots were very fine, and has been preserved from the frost, much better than those of many of his neighbors. he calculates that, in a good season, the beets yield 10 per cent. of saccharine, say six of crystalized sugar, 3 of molasses, and 1 of molasses contained in the cake. Now all the manufactories which I have yet seen were very large, and conducted at an expense of machinery truly astounding: this I was regretting to a person in this town, who told me there was a curious man residing in one of the back streets, who had made sugar this winter, with machinery of his own invention, and almost by the labor of his own hands: he took me to see his works, but he had finished crushing: I found him a native genius; he told us he had not the means to purchase the expensive machinery, still he was determined to make sugar, and so he did; his premises are small, and his works entirely *without steam*; his crushing mill is driven by horses, which he feeds upon the cake, and he hires land ready prepared for the beet, of the neighboring Farmers; thus he has every disadvantage, and yet, in this way he made 100,000 lbs. of sugar from the 2d Sept. to the 21st March, (I think he said) and intends to make 200,000 next year. It is curious to see his machinery after being so much amongst steam engines, and a power of 120 horses, &c., but much of it might be adopted for the use of our Farmers. He has given me permission to make drawings of the whole, and I mean to off coat and work with him at crystalizing his molasses, the most difficult part of the process by far

* * * * But the cultivation of the beet embraces three grand and distinct objects; 1st the making of the sugar. 2d the feeding of cattle, 3d the improvement of agriculture or rather of *husbandry*, either of these is of vast importance; together, they form a whole, which I have no fear about, let competition come from what quarter it may.

* * * * *

One thing is certain, all the Continent is preparing to make Sugar from the Beet and from hence to Belgium the country is covered with it and Sugar-houses; in many places between Valenciennes and this, I counted six or eight of these large buildings together, and at one place there were actually twenty in sight at one time! This says something—what is it?

* * * * *

At Valenciennes, a gentleman is erecting an immensely large building as a Refinery for Beet Sugar—he will refine two millions of pounds a year; he politely showed me the works, and invited me to visit him again, when all is in operation, which I intend to do, as this part of the business may eventually be of importance to us. There are many very large Sugar-houses near Lisle, which I am to see after I have finished here; they will not then be crushing, but working up Molasses. I can then see their machinery, which is almost different in every manufactory which I visit, especially the arrangement.

Tuesday, 5th of April.—I have now spent a long day at Mr. C.'s noble manufactory.—Indeed I know not how to express what I feel. One thing is quite certain, the manufacture will soon be planted in America by some one, and be followed up by hundreds.

* * * * *

The land must be *healthy*, not a *wet sub soil*, for if it be so, although it might produce the finest crops, they would decay during the winter to a certainty.

* * * * *

My friend—he of the small manufactory—will enable me to do all that is necessary for our farmers, but they must not expect to work at such a profit as is done by the improved machinery. But I find, after all, I must purchase the Drill. I have spent some time to day examining its parts, and the more I see the more am I satisfied it would not be in my power to do justice by a model either to it, to myself, or to the *land of my adoption*. It is to be taken to pieces and packed more snugly; but whatever be the cost or the labor, I am willing to debit it with the whole with no fear for the result. you will see it is cheap too.

* * * * *

If I stay, I shall witness much of the cultivation of the crop of Beet, and probably some other crops that might be advantageously transported to America.

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ARRAS, 22d April, 1836.

JACOB SNIDER, Jun. Esq:

DEAR SIR:—Your welcome letter of 22d March I have received, and am truly thankful that all our friends are in health; will they accept my affectionate and grateful remembrance. By this time you will have received several letters from me on the subject of my mission. I have said that the Beet sugar business is becoming of the greatest importance to the whole continent; as a proof that it is so, there is not a coppersmith or iron founder in this department of France who has not more orders for machinery than he can execute. One in this town, who employs 300 workmen in copper brass, and iron, has orders for two years to come, chiefly in the sugar machinery for foreign countries. I have also said that the success attending the fabrication has in a great measure been owing to the encouragement held out by the government who have offered premiums for the best modes of preparation, and in this they have been joined by the scientific bodies in France and other countries Thus far all has been well, and no one can calculate the good that has been effected by this branch of Agrico-manufacture: the face, both of the country and its inhabitants, has been changed, and industry and happiness have been the result; but now the government is about to work a revolution, which, like all others that have taken place in this country, aims at too much; it must pull down before it can repair. A tax is proposed to be laid upon Beet Sugar, which will in its consequences as effectually ruin the manufacture as *that* has been supported by the favor of the same government, for it is not possible for one manufacturer in ten to observe the restrictions to which all are made subject. In the first place every manufactory must be enclosed by a high wall built at the expense of the proprietor, and to have but one door of entrance, just within which a house is to be prepared for the residence of Excisemen, who are to be on duty here day and night, and to have the supervision of the concern; every man who makes 100,000 kilogrammes of sugar is to pay these Excisemen 2000 francs per annum for their support; 150,000 kils., 3,500 fr., and then comes the primary tax of 15 francs per kilogramme, on all sugar that is made. Now what is the object of the Government? Is it to assist the colonies? to levy money in the way of a tax? or to ruin the Beet sugar trade? If it be the first let them reduce the duty upon Colonial sugar; if the second, let them tax the sugar as is proposed, to which there is no objection; if the third, the plan which they propose will serve their purpose most completely. Now a great proportion of the manufactories are erected in situations where they could not be surrounded by a wall, as they are attached to other buildings; to remove these is quite out of the power of the proprietors, who have in many instances expended a fortune in their erections and fittings up: these therefore must be abandoned, as must all those of small extent, who could not if they would, afford to keep the attendants out of their slender business; many others would quit a pursuit lettered with such odious exactions. It is true some of the large manufactories might be continued, for sugar would rise in price in consequence of a scarcity in the market; the result however would be, the people would be debarred, as formerly, of the use of it. I have been led into this subject by your remark that the Island of Gaudaloupe has petitioned to be permitted to trade elsewhere than to France; but this, that Island has long done, and permission has not been given; nor will it be necessary if this tax be levied: but in the event of their being so permitted, how shall we in America be effected by it? would sugar be permitted to be introduced to the destruction of our own manufacture? From what I have seen I am not afraid to compete with the cane, acre for acre, for it is not the mere article of sugar that is of importance, or rather of the greatest importance; it is the spirit of industry, of happiness,—of beef and mutton, if you will, that it engenders in a country, which is of far greater consequence. Permit me to transcribe from one of the papers some remarks which are I think peculiarly applicable to the subject.—"However desirable it might be to preserve or to favor the Colonies, the time of their exclusive supply of the market with sugar is gone by; the species of cultivation now naturalized in 36 departments of France is well worth the produce of three Islands lost in the bosom of the ocean. To prefer the latter to the former is about as reasonable as to adhere to the use of bows and arrows after the invention of gunpowder.—The making of beet sugar, for which the population, in France has shown a wonderful aptitude, is a kind of *God-send* that should be taken advantage of, for the uniting together of agricultural and manufacturing art; the whole system of the law for imposing duties on Beet Sugar is bad, it starts from false ideas, and leads to the most lamentable results."

I am aware, however, that the question of free trade, like that of the currency, is to be handled delicately; I am not competent to the task and must leave this knotty point to those who are. I shall be capable, however, to make Beet Sugar on my return; and if he who made two blades of grass grow where but one grew before, deserved well of his country, may I hope to enjoy that luxury on my return. The present

season is remarkable for having its crushing process extended to an unusual length, which has given me advantages which I could not else have enjoyed. We are now busily engaged with the Molasses of second and third qualities, and I visit two manufactories for the purpose of initiation into this important branch of the process; I am also farming and planting beet roots for seed as well as preparing the material for clarifying at Mr. C.'s mills, at a short distance from the town. Mr. C. has two farms near, both of which I visit; he will have 400 acres of Beets on these this year; here are many hundred acres of wheat after Beets, clean as a garden, but the rotation is not good; spring corn is preferable, with seeds, and so Mr. Walker will say, I know. I went to inspect the large sugar house of Monsieur, the Deputy, last week; I had a letter of introduction to him from the Mayor of Boulogne; he was absent on his duty at Paris, but his lady received me graciously, giving me a letter to the manager of the works; he was not present, so I reserved the letter, to show you the warmth and kindness which I experienced from all. The works cost £12,000, and expend the steam of 90 horse power, but the principle is not good, and they work to great disadvantage; several of their boilers cost 2,000 francs each.—They keep 40 horses and mules, and I were engaged in sowing Beet seed with Mr. C—,s drill, which I should say drills five rows at once, harrowing in and rolling the seed at the same time. In a few days I am going to Valenciennes, to see a manufactory belonging to a farmer who has received the silver medal from the Society of Arts in Paris, for machinery by which with the help of his own family, he makes 50lbs of Sugar a day. I have heard also of two other manufacturers there who have improved machinery. But it is in this part of the country where they grow immense quantities of the white poppy for the oil. It is used instead of olive oil, and is sent to Paris and elsewhere to mix with that, and goes from thence all over the continent as the best *olive oil*. It is a very profitable crop, is cultivated with the greatest ease, and harvested most cheaply, coming ripe in about three months (some say two.) I visit two crushing mills, and am astonished to find that the produce of oil is 25 per cent from these insignificant seeds. One of these mills is on a very grand scale: the machinery in one room cost £4000, but is by no means necessary. I go to-morrow to see a windmill, where the same work is done to profit. The poppy is cultivated on exhausted soil, without manure; such yielding most oil. The seed is drilled, and kept clean, and the capsules when ripe are shaken into cloths spread upon the ground; and in one hour after, the oil is made and fit for market! This then is the crop for us; the plant flourishes well in light soils. I have this day dispatched to Havre, to the care of Messrs Wells & Green, a box containing 23 lbs. brown sugar, 1st and 2d quality *made under my inspection*; 6 lbs. of white powdered sugar of great quality, made from the Beet at Famars, near Valenciennes; two bottles poppy oil of 1st quality as samples, and 2 gallons of poppy seed of the true species, for sowing this season; which will yield seed sufficient for a goodbreadth next season. Will you *disseminate* this poppy seed very extensively: that we may judge of the proper soil, and the climate best suited to its growth.

Extract of a letter from a gentleman in London, dated March 30.

I enclose a letter from Mr. Pedder. He feels very sanguine. Has sent Beet seed per Havre Packets. He is very anxious to purchase the *seed drill*, about £20, and proposes having a model made. He considers it a highly valuable machine. I purpose writing to him to say that if he still entertains this opinion and a model will not clearly put you in possession of its merits, I will venture to authorise his drawings on me for the amount. Mr. Pedder seems very intelligent and assiduous and has been highly favored by circumstances. Dr. B gave him very useful letters, and he met at Arras a Prussian professor and chemist, with a draughtsman, in pursuit of the same object who had nearly finished his enquiries and gave him the benefit of them; also, an engineer sent there by Messes. Taylor & Co. and who is giving him every information.—He says the machinery is expensive and powerful. Mr. Pedder will remain in that neighborhood some time. I think you were fortunate in selecting Mr. Pedder; and he hopes to succeed.

From the Burlington Gazette.

THE SILK BUSINESS.

No. II.

The more I reflect upon the subject of Silk, the greater is my astonishment that Americans have only just awakened to a sense of their true interest in relation to it. The clear profit *per acre*, by raising Silk, may be safely set down at $150 to $200. Some experienced cultivators have made it reach as high as $300, while others have set it down at $175—perhaps the average would be sufficiently near the mark. Andrew Parmentier, of New-York, has given the following as the produce of one acre—

One acre of ground fenced by Mulberry hedges, and set out with trees,	$250 00
Interest and additional expense during five years,	187 50
	$437 50

The acre will then produce,
from 5 to 10 years, 10 per cent.
10 to 15 " 47 do.
15 to 20 " 112 do.

This will average nearly 45 per cent. for for the first twenty years, and continue to 112 per cent. afterwards. According to Mr. Parmentier, an acre will pay on an average of 20 years, $205 profit every year, and $490 a year afterward. What orchard of fruit trees—what fields of grain or vegetables—can bear any resemblance to a profit so enormous?

Mr. Daniel Rowe, an ingenious and enterprising citizen of Dayton, Ohio, about 3 years since, occupied three rooms in that city with worms. He had never before that season paid any attention to them, or the culture of the Mulberry. He hired a man and boy to go to the forest, two miles from Dayton, and gather leaves; two girls were employed five weeks in feeding the worms and preserving the cocoons; at the end of that time he gathered eight barrels of cocoons. He was indebted wholly to the woods for their support. About the same time he set out five acres of trees from the woods. Two years after that—mark the force of good example—a Silk factory was established at Dayton, and vests and handkerchiefs were manufactured with success, and much to the honor and delight of the citizens. The five acres, at the time I write, ought to yield a clear profit of twelve hundred dollars a year—for unlike an orchard, the trees go on improving at a great rate every year.

Two log cabins at a Shaker village in Ohio, and a garden-house, were appropriated as nurseries for the Silk worm. The leaves were brought half a mile by boys, and the worms fed and cleaned by two girls 13 years old, superintended by a young woman. In five weeks the cocoons were dried and reeled into raw Silk, and sold in Cincinnati for $97 50.

The Valentine Silk Company, at Providence, R. I., have 30,000 trees on their farm, each tree yielding on an average, half a pound of Silk, worth at least $5 per pound, making their income $75,000 per annum. A lady in Preble county, Ohio, has the present season, with the aid of one small girl and two boys about twelve years old, fed and attended 50,000 Silk worms, with the leaves of the common wild Mulberry. From her labors of six weeks—for the worms are only six weeks from their birth to their death—she realized $225 from the sale of the raw material—when put into skeins it would bring $400. The Silk she manufactured is equal in elegance and richness to any foreign Silk—and yet she accomplished all her labors without a tenth part of the instruction which will be given in these numbers before the subject is concluded.

The Hamilton County Agricultural Society, in their circular concerning Silk, state that four acres planted in white Mulberry trees, near Boston, in 1835, maintained worms enough to produce 420 pounds of Silk, which, at $4 per pound amounted to $1680. In France, a single tree has been known to produce five dollars by the sale of its leaves. Mrs. Parker, of Claremont county, Ohio, has been active in introducing and extending a knowledge of the Mulberry in the Miami Valley. She raised from 50,000 worms $180 worth of Silk, assisted by her two little daughters only. She is now preparing to extend her business and devote her time and talents to the same. Gideon B. Smith, of Baltimore, a man well known and of high character, says, "that a boy eleven years old, assisted by a woman, raised and attended 100,000 worms, and obtained $140 worth of Silk at the end of six weeks." In two townships in Connecticut, FIVE TONS of raw Silk were raised last year! The sales of sewing Silk alone, this year, in Mansfield, Connecticut, amounted to $95,000. James Smith, of Bladen county, N. C., made 100 pounds of fine sewing Silk from 200,000 worms, for which he received the sum of $700. Four or five negro children attended them under his inspection.

The profits, too, of merely raising the trees for sale, are enormous. A person in Hampshire county, Mass., sowed fifty cents worth of seed in the spring of 1834, and the next spring sold $50 worth of trees, and $100 worth the same autumn. He had still another $50 worth left. He has thus multiplied his fifty cents into $200—and all done from less than a rod of ground. A gentleman from Northampton, Mass., has sold plants, it is said, to the amount of

$12,000, the whole cost of raising and attending to which, could not have much exceeded one thousand. Though such enormous profits cannot continue long, yet the demand for trees will continue to increase from year to year, still affording an immense return to those who rear them. Where, for instance, will the Burlington Company obtain *their* supply? If they are wise, they will not lose precious time by waiting till the seed they may sow shall grow up into trees, but will supply themselves with plants from other nurseries, already grown to a size to be capable of feeding at least a limited number of worms.

Let me close for the present by annexing a few advertisements, taken at random, from eastern newspapers which came into my way a short time since :—

"COCOONS AND RAW SILK.

"The Northampton (Mass.) Silk Company will pay cash for Cocoons and Raw Silk, at their establishment at the Oil Mill Place, in Northampton. The Cocoons should be stripped of the floss, and placed in the sun three or four days in succession, to destroy the chrysalis, and should not be packed for transportation till they have been gathered three weeks. If they are put up before well cured, the dampness from the dead chrysalis will cause them to heat and render them useless. They should be carefully packed in dry boxes or barrels, not pressed, but shaken down. The Company will contract for any quantity to 10,000 bushels, to be delivered in good order at Northampton. The price will be regulated according to quality. Cultivators should be aware that a loss of fifty per cent. is often made by want of attention in feeding.—Consequently the price will vary, from $2 50 to $5 per bushel will be paid. It is the intention of the Company that this shall be a permanent market for Cocoons and Raw Silk. Cocoons will be purchased by the pound, as soon as the necessary experiments have been made, to regulate, the price according to the age of the Cocoons, as it is well known they become gradually lighter for several months, till all moisture is evaporated. Communications (post paid) may be addressed to SAMUEL WHITMARSH, President of the Company. July, 1836."

The foregoing contains much useful information, besides affording a glance of the extent to which a single company are able to go in so new a business. But for *extent*, look at the following—

"Cash paid for Raw Silk, Cocoons and Mulberry Seed, by the Connecticut Silk Manufacturing Company. Instruction, steady employment and fair wages given to young women, to be employed in the Silk Factory. ONE HUNDRED GIRLS will find immediate employment at Fancy Weaving.

CHRISTOPHER COLT, Agent.

One hundred girls wanted at a single establishment! But the fact needs no comment.

FORCE OF THE WATERS.

Extracts from Audubon's Ornithological Biography, Vol. II.

"It was the month of September. At the upper extremity of Dennisville, which is itself a pretty village, are the saw-mills and ponds of the hospitable Judge Lincoln, and other persons. The creek that conveys the logs to these ponds, and which bear the name of the village, is interrupted in its course by many rapids and narrow embanked gorges. One of the latter is situated about half a mile above the mill-dams, and is so rocky and rugged in its bottom and sides as to preclude the possibility of the trees passing along it at low water, while, as I conceived, it would have given no slight labor to an army of woodsmen or millers to move the thousands of large logs that had accumulated in it.—They lay piled in confused heaps to a great height along an extent of several hundred yards; and were in some places so close as to have formed a kind of dam. Above the gorge there is a large natural reservoir, in which the head waters of the creek settle, while only a small portion of them ripples through the gorge below, during the latter weeks of summer and in early autumn, when the streams are at their lowest. At the neck of this basin, the lumberers raised a temporary barrier with the refuse of their sawn logs. The boards were planted nearly upright, and supported at their tops by a strong tree extended from side to side of the creek, which might there be about forty feet in breadth. It was prevented from giving way under the pressure of the rising waters by having strong abutments of woodland against its centre, while the ends of these abutments were secured by wedges, which could be knocked off when necessary. The temporary dam was now finished. Little or no water escaped through the barrier, and that in the creek above it rose in the course of three weeks to its top, which was about ten feet high, forming a sheet that extended upwards fully a mile from the dam. My family was invited early one morning to go and witness the extraordinary effect which would be produced by the breaking down of the barrier, and we all accompanied the lumberers to the place. Two of the men on reaching it threw off their jackets, tied handkerchiefs round their heads, and fastened to their bodies a long rope, the end of which was held by three or four others, who stood ready to drag their companions ashore in case of danger or accident. The two operators, each bearing an axe, walked along the abutments, and at a given signal knocked out the wedges. A second blow from each sent off the abutments themselves; and the men leaping with extreme dexterity from one cross log to another, sprung to the shore with almost the quickness of thought. Scarcely had they effected their escape from the frightful peril that threatened them, when the mass of water burst forth with a horrible uproar.

All eyes were bent towards the huge heap of logs in the gorge below. The tumultuous burst of the waters instantly swept away every object that opposed their progress, and rushed in foaming waves among the timber that every where blocked up the passage. Presently a slow, heavy motion was perceived in the mass of logs; one might have imagined that some mighty monster lay convulsively writhing beneath them, struggling with a fearful energy to extricate himself from the crushing weight. As the waters rose the movement increased; the mass of timber extended in all directions, appearing to become more and more entangled each moment; the ogs bounced against each other; thrusting aside, demersing, or raising into the air those with which they came in contact: it seemed as if they were waging a war of destruction, such as ancient authors describe the efforts of the Titans, the flamings of whose wrath might to the eye of the painter have been represented to the angry curlings of the waters, while the tremulous and rapid motions of the logs, which at times reared themselves almost perpendicularly, might by the poet be taken for the shakings of the confounded and discomfitted giants. Now the rushing elements filled up the gorge to its brim. The logs, once under way, rolled, reared, tossed and tumbled amid the foam, as they were carried along. Many of the smaller trees broke across, from others great splinters were sent up, and all were in some degree seamed and scarred. Then in tumultous majesty swept along the mingled wreck, the current being now increased to such a pitch that the logs, as they were dashed against the rocky shores, resounded like the report of distant artillery, or the angry rumblings of the thunder. Onward it rolls, the emblems of wreck and ruin, destruction and chaotic strife. It seemed to me as if I witnessed the route of a vast army, surprised, overwhelmed, and overthrown. The roar of the cannon, the groans of the dying, and the shouts of the avengers, were thundering through my brain; and amid the frightful confusion of the scene, there came over my spirit a melancholy feeling, which had not entirely vanquished at the end of many days. In a few hours almost all the timber that had lain heaped in the rocky gorge was floating in the great pond of the millers; and as we walked homewards we talked of the Force of the Waters."

AGRICULTURAL JURISPRUDENCE.

At the late term of the Supreme Court of Errors, in this city, a question of agricultural jurisprudence was settled, which has often been the occasion of much controversy, and sometimes of a total interruption of that social intercourse and interchange of kind feelings and offices, without which neighborhood ceases to be a blessing, and actually becomes a curse. The question arose in an action of trespass for taking a portion of the fruit from a pear tree. The facts in the case were these. The trunk of the tree stood about four feet from the line between the plaintiff and defendant, and its roots and branches extended some distance into and over the defendant's land. The defendant plucked the fruit from the branches overhanging his land, to within about one foot of the line for which the action was brought.

The defendant claimed, First, that he was tenant in common with the plaintiff, in the tree, and consequently had a right to take from the branches on his side of the

line. Second, that if he was not tenant in common with the plaintiff, he was owner in severality in that part of the tree which drew its nourishment from his soil, and that he had a right to take the fruit from the branches that overhung his land. Third, that if he was not owner of that part of the tree which is sustained by and overhangs his land, still he was entitled to the fruits growing on such branches. Fourth, that he had a legal right to remove the overhanging branches and projecting roots, they being a nuisance which he had a right to abate.

The court ruled the three first points against the defendant, and decided that the ownership of the tree was in the proprietor on whose land it was originally planted, and that he of course was entitled to all the fruit, though the roots and branches may have extended into and over the land of the adjoining proprietor. On the last point the court decided that the projecting roots and branches were a nuisance which the defendant might have abated; but had no right to appropriate to his own use.—[Silk Cuturalist.]

HISTORY OF THE FOUNDATION OF THE BRITISH MUSEUM.

Sir,—As you have occasionally devoted some of your pages to the subject of our National Museum, with a view to its improvement, and the extension of its public utility, I venture to trasmit to you some particulars respecting its foundation, not generally known, and which are not to be found in the article "British Museum," lately published in the *Penny Cyclopedia*, and which common report attributes to the pen of Sir Henry Ellis. The following sketch has been compiled with great care, principally from contemporary writers, whose authenticity may be relied on.

I am, Sir,
Your obedient servant,
S. S.

June 1, 1836.

Sir Hans Sloane, the founder of the British Museum, one of the most eminent physicians and naturalists of the eighteenth century, of whom an interesting memoir may be found in the *Biographia Britannica*, was not only distinguished as a man of science, but also as a liberal and patriotic citizen. He was a governor of most of the metropolitan hospitals, to which he was not only a constant benefactor, but also left considerable sums to them at his death.—He set on foot the scheme of a dispensary for the poor, and gave to the Apothecaries' Company, a piece of ground at Chelsea for a botanic garden, who, "that their successors and posterity might never forget their common benefactor," caused a marble statue, by the celebrated Rysbrach, to be erected to his memory. Sir Hans Sloane was also instrumental in establishing the Foundling Hospital, and formed the plan for bringing up the children, which proved the best that could be devised. He was the first who introduced into England the general use of bark, which he applied successfully to the cure of many diseases. Sir Hans Sloane also gave a sanction to the practice of *inoculation*, by inoculating two of the princesses, which more effectually established this great discovery, than all the treatises that had been written on the subject. But the share he had in the foundation of the British Museum, will most effectually preserve his name from oblivion. Having, with great labor and expense, during the course of his long life,* collected a rich cabinet of medals, objects of natural history, &c., and a valuable library of printed books† and MSS. He bequeathed the whole to the public, on condition that the sum of 20,000*l.* should be paid to his executors, for the benefit of his family, but which, according to his own declaration, in a codicil to his will, made a short time before he died, was not a *fourth* part of the then intrinsic value of his Museum.‡ And it should be remembered, that the sum of 80,000*l.*, expended in the first half of the eighteenth century, in the purchase of MSS., rare books, coins, gems, antiquities, and other curiosities, would produce a very different result, in point of quantity and quality, from the same smount devoted to similar purposes, at the commencement of the nineteenth—when a single MS. was sold for 2,000*l* or 3,000*l*. It may be safely asserted, therefore, that 200,000*l*. would now scarcely purchase such a collection as Sir Hans Sloane's was in the year 1753.

The following list of articles, contained in Sir Hans Sloane's Museum, is given in the *Biographia Britannica*, (art. Sloane,) which was published in 1763, only four years after the opening of the Museum to the public; it is a curious and important record, and as it was probably communicated to the writer of Sir Hans's life, by an officer of the British Museum, it may, we think, be entitled to all the credit of an official document.

Medals and coins, ancient and modern,	22,000
Antiquities, &c., about	1,125
Seals, &c.,	268
Cameos and Intaglios, &c., about	700
Precious stones, agates, jaspers, &c.,	542
Crystals, spars, &c.,	1,864
Fossils, flints, and stones, &c.,	2,175
Metal, mineral ores, &c.,	2,725
Earths, sands, salts, &c.,	1,035
Bitumen, sulphurs, ambers, ambergris, &c.,	399
Tales, micæ, &c.,	388
Testacea, or shells,	5,834
Corals, sponges, &c.,	1,421
Echini, Echinites, &c.,	659
Asteriæ, trochi, entrochi, &c.,	241
Crustacea, or crabs, &c.,	363
Stellæ marinæ, &c.,	173
Fishes, and their parts,	1,555
Birds, and their parts, of different species,	1,172
Vipers, serpets, &c.,	521
Quadrupeds, &c.,	1,886
Insects,	5,439
Humana and calculi; anatomical preparations,	756
Vegetables, as seeds, gums, woods, roots, &c.,	12,566
Hortus siccus, or volumes of dried plants,	334
Miscellaneous things, natural, &c.,	2,098
Pictures and drawings, &c., framed,	310
Mathematical instruments,	55

Another list of the objects of Sir Hans Sloane's Museum, is printed in the introduction to the British Museum Synopsis, or 1815, (p. 3, note,) in which it is said that the quadrupeds, and their parts, amounted to 8,186, and the stones, ores, bitumens; &c., to 9,942. This account is stated to have been made up from a schedule handed about at the time of the purchase; its authenticity, however, is not vouched for. But why not quote the contemporary account in the *Biographia Britannica*, or refer at once to the catalogue itself, for information? It was surely accessible to the person who compiled this introduction!

"Besides this mass of curiosities," continues the writer in the *Biographia Britannica*, "his library consisted of more than 50,000 volumes, (347 of which were illustrated with cuts, finely engraven, and colored from nature,) 3,566 MSS., and an infinite number of rare and curious books."† Of the Sloanean MSS., the *Penny Cyclopedia* (art. British Museum,) furnishes the following, as we are told, *demi official* account. "This collection principally consists of MSS. on natural history, voyages, and travels, upon the arts, and especially upon medicine. It comprises the chief of the celebrated Kœmpfer's MSS., with the voluminous mdoical collections of Sir Theodore Mayerne, and amongst them the annals of his practice in the court of England, from 1611 to 1649. It also contains a collection of medical, and other scientific correspondence, with numerous MSS. on history, poetry, and miscellaneous subjects."

We have no objection to a demi-official account of the British Museum in the Penny, or any other Cyclopedia;‡ but why do not the Trustees direct a sketch of the history of the Museum to be prefixed to the Synopsis, or Guide? This was done seventeen or eighteen years ago, but has been discontinued. That this Guide is susceptible of great improvement, in other respects, was admitted by the officers themselves, when examined before the Committee of Inquiry last session. See the Natural History Evidence, passim. In pp. 60, 61, and

* He died in 1753, in his 92d year.

† A remarkable instance of Sir Hans Sloane's liberality, as regarded his library, is worthy of record. If he found that he possessed duplicates of any books which related to medicine, he was accustomed to present them to the college of physicians; and if they treated of other subjects, to the Bodleian library, a rare, and, we are afraid, solitary example of disinterestedness and devotion to the cause of literature and science.

‡ In the *Penny Cyclopedia*, 50,000*l.* is the sum named. But this is the amount mentioned by Sir Hans in his will, which was made in the year 1739. The compiler of his article could never have seen the codicils, or he would not have committed so gross an error.

* Dodsley, in his Guide (1761,) enumerates some of the principal portraits, forty-six in number, of kings of England, and of numerous distinguished individuals. Some of these, we believe, are now exhibited in the Mineral Gallery, at the Museum, but the transverse light from the double horizontal skylights, renders it extremely difficult to choose any position from which they may be seen with advantage. Why are not these portraits transferred to the National Gallery, where Sir George Beaumont's, and the Rev. Holwell Carr's pictures, bequeathed to the Museum, are very properly placed?

† It must always be a matter of regret, that any of Sir Hans's books should have been *sold*. A considerable number, it is said, were "turned out" as duplicates, only a few years since. These were the founder's books, and should never have been disposed of; but many belonging to the Royal Library of the kings of England, given by king George II., have shared the same fate.

‡ See *Mechanics' Magazine*, May 28, 1836, vol. xxiv, p. 39.

65, of the Synopsis published in 1835, we are informed, (*mirabile dictu*) that the flesh of the salmon furnishes "one of the greatest delicacies of the table;" that the "flesh of the cod is white, regularly separates into flakes, is easy of digestion, and very palatable;" and that "the flesh of the sturgeon is excellent!!!" As the Synopsis is now said to be out of print, we trust that something more worthy of a National Museum will be produced. The price also should be reduced one-half, at least. See Evidence, No. 2769, 2794, and Appendix, p. 444. From the catalogue of printed books, (1817,) it would appear that the Museum does not possess a complete set of its own Synopsis; it is also no less strange than true, that no authorised guide to the curiosities of the place, was published for nearly half a century after it was opened.

"It is easy to perceive," observes the writer in the *Biographia Britannica*, "the advantage that will result to the public from this immense collection. To have access to such a cabinet as this is, in effect, to men of taste, like *making the tour of the world*, and having for their tutor a catalogue of thirty-eight volumes in folio, and eight in quarto, containing a short description of each curiosity, with a reference to the authors that treat of it more at large."

"From the British Chronologist," (vol. iii. p. 130, col. 2,) we learn that when the will of Sir Hans Sloane was proved, "Administration was granted to the Lord Cadogan, and Dr. Sloane Elsmere, Rector of Chelsea. The will consisted of five sheets of paper, all written with his own hand; and there were nine codicils to it. The testator, desirous that his collection *might be kept entire*, directed it to be offered to his Majesty at 20,000*l.*; and if this offer was declined, then first to the Academy of Sciences at St. Petersburgh, and then successively to the Royal Academy of Sciences at Paris, Berlin, and Madrid. If the King and Parliament accepted the offer, Sir Hans' trustees* were to apply for a power to enable them to preserve, maintain, and continue the collection at Chelsea, where it was to be shown, under proper regulations, for the satisfaction of the curious, and the improvement of knowledge." In the second codicil, Sir Hans observes, "Having had from my youth a strong inclination for the study of plants, and all other productions of nature, and having, through the course of many years, with great labor and expense, gathered together whatever could be procured, either in our own or foreign countries, that was rare and curious, and being fully convinced that nothing tends more to raise our ideas of the power, wisdom, goodness, providence, and other perfections of the Deity, or more to the comfort and well-being of his creatures, than the enlargement of our knowledge of the works of nature, I do will and desire, that for the promoting of these noble ends, the glory of God, and the good of man, my collection, in all its branches, may be, if possible, *kept and preserved together, whole and entire*, in my manor-house at Chelsea, &c." Sir Hans afterwards appoints several persons as a Board of Visitors, "to visit, correct, and reform, from time to time, as there may be occasion, either jointly with the said trustees, or separately, &c.;" and had this valuable regulation been attended to by the Legislature, in framing the act of incorporation for the British Museum, there would, probably, have been but little necessity for a Parliamentary inquiry.

From the respectable authority already quoted, we extract the following interesting account of the proceedings, which took place after the death of Sir Hans:

"1753—Jan. 27. The Lord Cadogan, and the other executors of the late Sir Hans Sloane, Bart., having desired the trustees who were appointed by Sir Hans, *to take care and keep together his Museum*, to meet at the Manor-house at Chelsea, at ten in the morning, they met there, accordingly, about forty. Lord Cadogan was there, and received them in the politest manner; and having caused the galleries, libraries, and all the other apartments, to be shown, they assembled in the great room, where his Lordship produced Sir Hans' will, and acquainted the trustees with the codicils, the nature of which has been already detailed. In case the offer was excepted, as to the Museum remaining at Chelsea, he gave the Manor-house there,* with the Museum, as it is now disposed, which would save the expense and hazard of removing the same; to be kept open, at proper hours, for the access of the studious and curious. Then Mr. Sloane acquainted the trustees that the executors being apprehensive of danger, *the medals, of which there were great quantities of gold and silver, besides a series of curious copper ones, and the precious stones, such as pearls, rubies, emeralds, &c., and the vases of gems, &c.*, had been removed for safety to the Bank of England, and that two of the executors had seen them all packed up. The Earl of Macclesfield having been desired by the trustees to take the chair, the will and codicils were read. Lieutenant General Oglethorpe† gave an account of the intention of Sir Hans, of the nature and value of the Museum, and produced an abstract of the articles it contained,‡ and desired that Mr. James Empson, who had taken care of the Museum for many years past, by Sir Hans Sloane's order, should read the abstract and explain the articles, which he did accordingly, and was appointed their Secretary by the Trustees. Sir George Littleton then moved, and Mr. West seconded, that a memorial should be presented to his Majesty, relating to this matter, and a committee was appointed to draw up the memorial, and lay the same before a general meeting of the Trustees." This having been done, on June 7, 1753, an act of Parliament was passed for purchasing Sir Hans Sloane's Museum, and also the Harleian collection of MSS., and for providing a general repository for the same, as also for the Cottonian Library, by a lottery. This is the act of incorporation of the British Museum, that body not having yet obtained any charter. Montague House was afterwards purchased by the government for 10,000*l.*; and the various collections having been removed to this depository, the British Museum was opened for public inspection on the 15th of January, 1759.

Among the *first elected* Trustees appointed to conduct the new establishment, were several persons eminent for learning and science; viz., the Right Honorable Philip York, author of the justly celebrated "Athenian Letters;" Sir George Lyttleton, Bart., afterwards Lord Lyttleton, the well-known author; Sir John Evelyn, Bart., son of the celebrated Sir John Evelyn, and himself an author; Nicholas Hardinge, Esq., a Barrister, author of Latin Poems, and distinguished for the cultivation of the Belles Lettres; the Rev. Dr. Birch, Secretary of the Royal Society, and author of many well-known biographical and historical works; Dr. John Ward, Professor of Rhetoric at Gresham College; and Mr. William Watson, afterwards Sir William Watson, a celebrated physician of the day.*

The *Biographia Brittanica* (art. Sloane,) presents us with a curious account of the first establishment of *officers*, which consisted of a Principal Librarian† at 200*l.* a-year; three Under Librarians, 100*l.*; three Assistants, 50*l.*; a Keeper of the Reading-room, 50*l.*; a Porter and Messenger, 50*l.*; one man, 30*l.*; and four women servants; which would probably amount to 900*l.* a-year, and notwithstanding the insignificance of their pay, "the officers were remarkable for being a sensible and learned set of men;"‡ the salaries of the officers, assistants, attendants, &c. in 1835, was more than *eleven thousand pounds*:§ between the years 1823 and 1835, 393,600*l.* has been spent on the new buildings; and the other grants by Parliament, from the year 3751 to 1835, amount to 619,661*l.*!‖ These facts being upon record, we cannot see with what justice the secretary of the Museum can complain of "*the necessity of perpetual reference to the House of Commons; of the jealousy of that House in regard to the mode in which the public money is expended, the clamor more or less prevalent for economy, furnishing sometimes a reason for declining expense*, AND ALWAYS A CONVENIENT EXCUSE, *as obstacles to the improvement of the*

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* These were 58 in number, containing the names of some of the most distinguished persons, scholars, and philosophers, of the day, both English and foreign. Among the foreigners who are trustees, are, it is curious to remark, the names of the Right Hon. Henry XXVIII. Count of Reuss; the Rt. Hon. and Rev. Count Zinzendorf, the Lord Advocate, and of the Chancellor and Agent of the United Fratrum, a sect founded by Count Zinzendorf, and afterwards known by the appellation of "Moravians." Vide British Chronologist, vol. iii. pp. 136, 137.

* Sir Hans' trustees having afterwards consented to the removal of the Museum from Chelsea, the government gave them the Manor-house, to be disposed of, along with his other property, for the benefit of the family.—*Biographia Britannica*, art. Sloane.

† This gentleman, with Archbishop Potter, patronised Count Zinzendorf, and obtained an act of Parliament for the protection of his followers throughout the British dominions.

‡ Already given in p. 260.

Universal Magazine, for December, 1753, vol. xiii. p. 283.

† It is a curious fact, that the three first persons who held this office were *physicians*, viz., Dr. Knight, Dr. Maty, and Dr. Moxton. Joseph Planta, Esq., F.R.S, succeeded the latter in 1799, and for twenty-eight years discharged the responsible duties of his office in a manner which excited the admiration, and gained for him the esteem, of every one who had occasion to seek his assistance. His uniform courtesy of manners and gentlemanly deportment, as well as his proficiency in modern languages—which enabled him to pay proper attention to the many distinguished foreigners who visited the Museum—must be fresh in the recollection of many of our readers. Mr. Planta was at once "a scholar and a gentleman." *Heu valde deflendus!*

‡ Dodsley, Introduction, p. 6.

§ 11,082*l.* 8*s.*; the whole expenditure being 19,076*l.* 4*s.*—Vide Annual Parliamentary Account for 1835, presented in 1836.

‖ British Museum Report, 1835. Appendix, p. 568.

British Museum; and as tending to prevent that course of DIGNIFIED LIBERALITY *which is best calculated to secure the respect and affection of the people, and to promote their wealth and happiness.*"* Admitting that this censure applies to past governments, the present executive must be exempted from any such caustic observations. In August, 1835, in addition to the sums above stated, the British Museum received a special grant of 6000*l.* for the purchase of Mr. Salt's Egyptian Antiquities; and in the present year they have been enabled to obtain, by the liberality of the Treasury, without applying to Parliament, Mr. Sheepshanks's magnificent collection of Dutch etchings, which cost 5000*l.*; a portion of Mr. Heber's MSS. of the value of 2000*l.*; the celebrated collection of Durand vases, said to be greatly superior to the Hamilton collection, the price of which has not yet transpired; and lastly, unique Bible of Alcuin and Charlemagne, which was bought in at Mr. Evans's for 1500*l.*, but which has since been purchased by the Museum for a less sum.

After this, let us hear no more of the "obstacles to the improvement of the British Museum;" the only real "obstacle" to its improvement, and to the consequent extension of its public utility, is to be found in the *defective constitution* of that establishment, so pertiniceously defended by two of its leading officers†. Let us hope, however, that when the present Committee of Inquiry make their Report to the House, some plan may in consequence be adopted which will effect the desired result.

We cannot conclude this brief history of the foundation of the British Museum, without expressing our surprise and regret, that the British public, or rather those by whom the people are represented, should be so indifferent to the memory of Sir Hans Sloane as not even to exhibit a memorial of this illustrious man in any part of the Museum visited by the public. On entering the hall of this establishment, where it would naturally be expected that some such memorial should be found, we seek in vain for any "storied urn" or "animated *bust*" that shall remind us of the magnificent bequest of one of the greatest men of his day. But what are the objects presented to our view? A statue of Shakespeare, by Roubilliac; another of Sir Joseph Banks,‡ a very different person from the immortal bard of Avon; a guilt figure of Gaudma, a Burmese idol; and the statue of the Hon. Anne Seymour Damer, (who gave a Napoleon snuff-box to the Museum,) holding in her arms a pretty little naked baby, said to represent the "Genius of the Thames." All this incongruous array doubtless puzzles many of the simple folk who visit the Museum, and we have occasionally overheard many learned discussions as to which of these august personages the honour of founding the Museum belongs. It may be said, perhaps, by the Trustees that Sir Hans' "Collections" are the best statue that could be erected to his memory—*si monumentum requiris, circumspice!* but suppose that it should turn out that a *bust* of Sir Hans Sloane was formerly in the possession of the Museum, will it be considered *crimen læsæ majestatis* to inquire what has become of it? Is it placed in the Medal Room,* together with the busts of Sir Thomas More, Dr. Samuel Clarke, and a noble bust of Homer, in bronze, of the most exquisite Greek sculpture, said to have been found near Constantinople?† And, like the coins, medals, and gems,‡ and certain MSS., are these "busts" become "select," and to be inspected only by "particular permission," and "by a few persons at a time?" Or has the bust of Sir Hans been consigned to the obscurity of some attic? Or has old *Tempus edax rerum* crumbled this frail memorial into its original dust? Arise, shade of Sir Hans! and haunt the nightly slumbers of the Curators till "the bust" be restored to its "pedestal on the staircase,"§ where, in the year 1784, it was still to be seen, but where the "musk-ox" now presents itself to our gaze.

Although no notice can be found of Sir Hans Sloane's bust, or of those just enumerated, in the "Museum Synopsis" of 1835, *another bust* is named with the most elaborate praise—that of Mr. Charles Townley, whose collections were purchased by the Government, after Committees of the House of Commons had been appointed to ascertain their commercial value; and although it may be quite proper to preserve *his* bust, it should not supersede that of the founder of the Museum. There is also in the Print Room a portrait of Sir William Hamilton, whose collection was purchased. We seek in vain, however, for any memorial of Sir Hans Sloane; his name occasionally figures in the "Synopsis," but only in company with other donors. This ough to be remedied forthwith; for we are old-fashioned enough to think with Herodotus, that "*Things past ought not to be extinguished by length of time, nor great and admirable actions remain destitute of glory.*"

S. S.

AN ADDRESS TO THE CITIZENS OF HARTFORD, ON THE BIRTHDAY OF LINNÆUS: MAY 24TH, 1836. IN BEHALF OF THE OBJECTS OF THE NATURAL HISTORY SOCIETY; FORMED OCTOBER 8, 1835. BY SAMUEL FARMER JARVIS, D. D., PRESIDENT OF THE SOCIETY, &C., &C.

LINNÆUS.

In 1732, a poor and friendless stranger from a little town in Dalecarlia, presented himself at Leyden to the illustrious Boerhaave. His indigence was so great, that when in college he had been obliged to wear the cast-off shoes of his fellow-students; and though after he had left Upsal, he gained a little money by the practice of medicine, yet by the time he arrived at Hamburg all his resources were exhausted. He persevered, however, in making his way to Holland; and the great physician whom I have named recommended him to a rich proprietor of the name of Clifford, who had a taste of natural history, and possessed at Hatecamp, between Leyden and Hærlem, a magnificent garden, cabinet, and library. In this hospitable abode he remained for three years, enjoying abundantly all the assistance necessary for his favorite studies. Need I tell you that this poor stranger, thus indebted to the munificence and love of science of one rich individual, was the great Linnæus!

In 1735 was published at Leyden, the first sketch of his System of Nature, or the three kingdoms of nature systematically set forth, by classes, orders, genera, and species. It consisted of three tables, each contained in a single sheet; and this, with another treatise of twenty-six pages published the following year, contained the germ of all that he afterward wrote. This work of twenty-six pages, contained, in the form of aphorisms, the theory of botany; and it was the result, as the author informs us, of seven years' study, and the examination of eight thousand plants. It was followed in successive years by three other works, which laid the foundation of the great revolution in botany; and fifteen years afterward, the whole was condensed in an octavo volume, containing proofs in every page of the most subtle intellect, and a most astonishing depth of observation. This single volume has become the fundamental law, the constitution, as it were, of the science; a constitution acknowledged and reverenced by botanists of every nation; and notwithstanding the immense quantity of plants since accumulated, and the innumerable facts which skilful observers have since added, principally on vegetable anatomy and the internal structure of fruits and seeds, his system of Linnæus is even now in full vigor.

It has become, indeed, in some sense, a universal language; and in every country, however remote, where a scientific botanist or even a skilful gardener is to be found, it is sufficient, in order to be understood, to designate a plant by its Linnæan name.—It was not, as we have seen, the discovery of the sexual system which gave Linnæus his fame and his sovereignty. That discovery is claimed by England; and it preceded the time of Linnæus half a century.—It was rather the distinctness, the regularity, the energetic precision of his system, and especially the convenience of what he called the *trivial*, or as it is now termed, the *specific* name, which gave him this authority. This last simple contrivance alone by which the overburthened memory of the botanist was relieved from the constant accumulation of long descriptive phrases, was found so useful, that, dating from that epoch, he reigned over the botanic world without a rival.

LINNÆUS, BUFFON, AND DAUBENTON.

For nearly a hundred years, the royal garden of plants at Paris, the establish-

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* Ibid. Evidence, No. 623.

† See the Evidence of Sir Henry Ellis and Mr. Forshall, passim.

‡ There is also a *portrait* of Sir Joseph Banks, by Lawrence, in the Cracherode Room.

* "A few modern busts, some of which belonged to Mr. R. P. Knight, are preserved in the Medal Room."—Penny Cyclopedia, art. British Museum. And it may be added, a bust of some unknown female in the Magna Charta Room; of this presiding *deesse* we know nothing.

† Dodsley's General Contents of the British Museum, 8vo. 1761, p. 4 and Companion to the Principal Places in London and Westminster, 12mo. 1784, p. 94. The bronze bust of Homer is also noticed in Harris's Curiosities of London and Westminster for 1805, p. 175, but there is no mention of the bust of Sir Hans Sloane.

‡ When the Museum was first opened, the Pontifical medals were exhibited in glass cases; and in the year 1784, a series of French medals, beginning with those of Pharamond. See Dodsley, p. 18: Companion, p. 100.

§ Companion to Lond. and Westm. 1784.

ment of which was coeval with that of our city, was greatly neglected, and its revenues were appropriated to other objects.—But in 1732, the superintendence of it was separated from the office of the first physician to the king and confided to Charles Francois Du Fay, who soon rendered it the finest garden in Europe. He died in 1739, and on his deathbed recommended Buffon as the only man who seemed to him capable of following out his plans. Buffon was a few months younger than Linnæus, and survived him about ten years. Their characters were essentially different. Linnæus was methodical, patient, concentrating, and concise; Buffon despised system, was brilliant and imaginative, diffuse and fond of ornament. Eminently fitted to render a subject popular when the materials were collected and laid before him, he was utterly incapable of that minute, and accurate, and unwearied observation, which are so essential to the science of the naturalist.—Happily he had for his associate Daubenton, whose qualities were precisely those in which Buffon was defective. The collection of facts with which he enriched the history of animals is immense; and the care with which he observed them was so great, that Cuvier has given him a praise, which from any other mouth would have seemed extravagant: *in vain do we look for an error.* He described only what he had seen himself. He did not even draw those general conclusions which most naturally arise from established facts; and his timidity in this respect was so cautious, that Camper said of him, he did not himself know how many discoveries he had made.

It was unfortunate for the interests of science, that Buffon appears to have treated him unkindly in permitting an edition of the History of Quadrupeds to be published, in which the description and anatomy of Daubenton were suppressed. In consequence of this, he refused any further cooperation in the work; and in the history of birds his place was poorly supplied by Guineau de Montbelliard and the Abbe Bexon.

After what has been said of Buffon, it will no longer excite surprise that, in the popular estimation, his fame should so entirely have eclipsed that of Linnæus.—Another cause of his celebrity was, the advantage he possessed in the superintendence of the garden of plants, and the facilities afforded him for forming collections in a city which had become the capital of the scientific world.

Two schools of natural science were now formed; the one pursuing the system of the Swedish naturalist, the other following the more popular course of the brilliant Frenchman.

Time would not permit me to do more than name the individuals who formed these respective schools; and I therefore purposely omit them, lest among so many I should commit injustice by selection.—From 1735 to 1798, when Cuvier published his first work, twenty-eight authors are enumerated on Entomology alone;* each of whom have contributed, more or less, by their observations, to enrich the history of insects. Of these, there were, one Italian, two Danes, three English, three French, three Swedes, three Swiss, four Dutch, and nine Germans. In the other departments, authors have not been so numerous, but the whole science has been carried forward with an impetus truly astonishing. The French, the Germans, and the English have vied with each other in this generous and noble rivalry.

If the French have surpassed all other nations, it must be attributed to the possession of such a treasure as their cabinet of natural history. It may be said to have been created by Daubenton, and has ever since been continually augmented by the zeal of individuals and the patronage of government. Even in the stormy times of the Revolution, when a political frenzy seemed to have seized the whole nation, this splendid monument of science, though for a time neglected, and deprived of its support, was spared, and finally patronized. It was in the spring of 1795 that Cuvier first visited the French capital, and in July of the same year was appointed assistant lecturer of comparative anatomy in the garden of plants. Here, in a lumber-room of the museum of natural history, he found four or five old skeletons, collected by Daubenton, and cast aside by Buffon.

It is interesting to trace from their commencement the history of noble institutions, and to see how much can often be done by the persevering industry of a single individual. These skeletons Cuvier made the basis of his museum, and, encouraged by some professors, though opposed by others, went on in the formation of it with untiring effort. In less than forty years, and within the compass of his own invaluable life, that museum has become one of the wonders of the age, and, together with its immortal author, has created a new epoch in the history of natural science.

GEOLOGY.

The practical knowledge of this branch has been as old as the attempts of man to explore the hidden treasure of the earth; and the regular formation and succession of strata, together with the disturbances occasioned by earthquakes, volcanoes, and inundations, have been remarked at a very early period. The existence, also, of organized bodies in a fossil form, embedded in several of these strata, has been for centuries the occasion of wonder and perplexity. I should weary my readers were I to tell them of all the crude conceptions, and absurd fantasies invented to account for these phenomena. They were such as absolutely to bring geology into contempt; and it was by many regarded as a visionary employment of the human intellect, till the work of Cuvier on fossil organic remains gave it a new character, and produced throughout the world the sensation of a surprising discovery.

The method of considering each separate organ, and tracing it through the whole series of animals, had led him to certain general and invariable laws of combination, by which the possession of one series of bones would indicate the necessary connexion of another series. "A beast of prey, for instance, would always have teeth fitted to devour that prey, and claws fitted to seize it. A ruminating animal, on the contrary, would have hoofs instead of claws, and teeth fitted only to grind its vegetable diet. In this way, the possession of even the fragments of an animal would enable him to complete its whole structure, and determine to what genera or species it belonged.

Aided by M. Brogniart, an eminent geologist, Cuvier commenced his researches at Montmartre, and in the quarries of gypsum in the environs of Paris. These had, for many centuries, furnished the building stone of that metropolis, and had been sunk to the distance of two hundred and 43 Paris feet. About fourteen or fifteen feet below the surface, there are strata of marine formations, attesting the presence of salt water, which have altogether a thickness of nearly seventy-seven French feet. Below these incontestible proofs exist of a soil anciently inhabited by quadrupeds of different species, reptiles, birds, and fresh-water fish.—Below these are still deeper strata, containing productions of the sea. By collecting the scattered bones of these animals and reproducing their forms, according to the unerring rules of anatomical science, Cuvier discovered one hundred and sixty-eight vertebrated animals, forming fifty genera, of which fifteen are no longer in existence. Many of the individuals, even of existing genera, are of enormous size; and what increases the wonder, they are such as are now found only in other regions and other climates. No trace was found of human skeletons, or of the order quadrumana.—Almost the entire skeleton was discovered of a species of opossum, an animal which now exists only in America; and this single fact at once overturned the theory, that the American genera had come from their own soil, and had never extended themselves to the other portions of the globe.*

I shall add no more on this subject, excepting to state, that all the subsequent re-

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* See Dumeril.

* See the memoir of Cuvier, "Sur le Squelette presque entier d'un petit quadrupede du genre des SARIGUES trouve dans la pierre a platre des environs de Paris," in the third volume of his "Ossemens fossiles." "This rich collection," observes the distinguished discoverer, "of the fragments and skeletons of the animals of a former world is doubtless a wonderful circumstance. It has been amassed by nature in the quarries which environ our city, as if reserved by her for the researches and instruction of the present age. Each day we discover some new relic; each day adds to our astonishment, by demonstrating more and more, that nothing which then peopled this part of the globe has been preserved on its present surface. There is scarcely a block of gypsum in certain strata which does not contain bones. How many millions of these bones have been already destroyed since these quarries have been dug, and this gypsum has been employed in building! How many are, even now, destroyed by mere carelessness! How many, by their minuteness, escape the observation of the most attentive workmen! One may judge of this by the fragment I am about to describe. The lineaments there imprinted are so slight, that to detect them we must view them closely.—Yet how precious are these lineaments!—

searches of geologists, of every nation, have confirmed the truth and the importance of this great discovery. The natural evidences of a sudden and universal deluge, and the probability of the Mosaic chronology, have been set forth with a force of truth which has borne down all opposition; and although there are still great and very embarrassing difficulties to check the pride of human knowledge, the Christian philosopher is encouraged to wait with patience, till some other bright discovery shall

"Vindicate the ways of GOD to man."

INFLUENCE OF SCIENCE ON RELIGION.

Finally, let me address you as Christians, and ask, what occupation can produce nobler views of the divine nature and providence than the contemplation of His works? The pages of inspiration tell us that the invisible things of GOD, namely his eternal power and godhead, have been clearly seen, since the creation of the world, being understood by the things that are made. It has been objected, I know, that many who have been warmly engaged in pursuits like ours, have, while surrounded by the wonders of creation, been unmindful of the great Creator. That such has been the fact, though to an extent far less than the objection assumes, we are not disposed to deny. We object, however, to the inference which some have thence drawn. We atttribute this result rather to the influence of a little knowledge on the corrupt heart of man, than to the extension of knowledge. We believe that "the knowledge which puffeth up" is eminently superficial; and in examining the progress of all sciences, we find, that proud presumption may accompany incipid discovery, but that more perfect investigations are invariably followed by profound humillity. Alphonso, of Castile, when the light of astronomical science first dawned, through his instrumentality, on the darkness of his age, could exclaim, that if he had been admitted to the counsels of the Creator, he would have arranged the universe better. He saw that the movements of the heavenly bodies could not be reconciled with what was then supposed to be the planetary system; and instead of doubting the correctness of his own knowledge, he dared to question the wisdom of the Almighty. How different on the mind of Newton was the effect of his sublime discoveries! With what awe do we behold that profound intellect, covering its face with its own wings, like the burning seraphim before the throne of God!* As the occasion of man's fall was an irregular desire of knowledge; so is it a part of that wisdom by which the Almighty seeks to lead us back to our paradise and to his presence, to surround us with wonders which give us constant and inexhaustable subjects of inquiry, and, at the same time, humble us by the perception of how little we can know without his aid.

It is thus with the science of natural history. The farther we advance in knowledge, the better do we perceive how much we do not know, and this perception must forever abase the most profound naturalists. "The minute philosophers," to borrow an epithet of the great Berkley, "may think, for a time, that their boasted discoveries are irreconcileable with revelation. They may raise the sand hills of their systems, and think from them to demolish the fortress of the divine word. Vain and impotent the attempt! Some fortunate discovery, as science advances, demolishes the whole by a single roll of its mighty waters, and the next wave washes it into eternal oblivion. Let us not fear, then, that revelation can ever be seriously assailed, or injured, by philosophy. It may sometimes be wounded in the house of its friends, by too great a degree of sensitiveness, which may prompt them to embrace untenable theories, and distort the language of the bible, to make it accord with what they consider as the result of experiment."*

INFLUENCE OF REPUBLICAN INSTITUTIONS ON SCIENCE.

We boast, and I for one am not disposed as yet to allow that we boast in vain, of exhibiting to the world the grand experiment, such as the world had never before seen, of a people governing themselves. We govern, and are governed, in a manner wholly inexplicable to the theorist of the old world. Not a soldier is to be seen in the wide extent of this immense republic, excepting on our frontiers. We govern, and are governed, by the will of the majority. Order is preserved, because it is the instinct of self-preservation; and every man knows, or ought to know, that his life, and liberty, and property is bound up in the life, and liberty, and property of the community.

In Europe, the interest of the whole is made subservient to the interest of individuals. In America, that of individuals is subservient to the good of the community. The interest of society is oftentimes sacrificed in Europe, to promote the interest of the individual; the interest of the individual, on the contrary, may be, and often is, sacrificed in America, to promote the interest of the public.

No doubt these are evils; and they are the evils of opposite systems. In this checquered state of being, where good and evil are the web and woof of the moral texture, the mixture cannot be avoided. It would be out of place for me to say, which system has the most evil or the most good; but let us take our system as it is, and ask whether it excludes scientific improvement? I answer, No. The monarchist

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They are the impress of an animal of which we find no other traces; an animal buried perhaps for thousand of ages, now reappearing, for the first time, to the eyes of the naturalist." He then proceeds, according to his method of induction, to show, in a very clear and satisfactory manner, that it can be no other than the American opossum; after which he concludes as follows: "I will not dilate upon the geological consequences of this memoir. It is evident to all who are even slightly conversant with the systems relative to the theory of the earth, that it overthrows nearly all of them, in what relates to fossil animals. Hitherto it has been thought that our northern fossils were only of Asiatic animals. It was admitted that the animals of Asia had passed into America, and had been buried there; but it seemed that the American genera had issued from their own soil, and had never passed into the countries which now form the old continent. This is the second proof" (the Tapir was the first) "which I have discovered to the contrary. And persuaded as I am, of the futility of all these systems, I am happy every time that one of them is destroyed by a well established fact. The greatest service which can be rendered to science, is to clear the ground before we proceed to build; to begin by demolishing those fantastic structures by which its avenues are choked, and which deter from such occupations those who have happily become habituated, in the exact sciences, to yield only to evidence, or at least to class propositions according to their degrees of probability. With this last precaution there is scarcely any science which may not become almost geometrical. The chemists have lately proved this with regard to their science; and I hope the time is not far distant when the same may be said of anatomists." If an apology be required for this long note, I hope it may be found in the interest which every American must feel, in a fact so eventful and extraordinary as that which has given rise to it.

*How sublime is the thought with which Newton closes his treatise on optics! The whole universe, all material things, from comets and planets down to the bodies of animals, the organs of sense and motion, and the instinct of brutes and insects, "can be the effect of nothing else than the wisdom and skill of a powerful everliving Agent, who, being in all places, is *more able by his will to move the bodies within his boundless, uniform censorium, and thereby to form and reform the parts of the universe, than we are by our will to move the parts of our own bodies.*" So in his Principia: "Deum summum necessario existere in confesso est. Et eadem necessitate *semper est et ubique.* Unde etiam totus est sui similis, totus oculus, totus auris, totus cerebrum, totus brachium, totus vis sentiendi, intelligendi et agendi; sed more minime humana more minime corporeo, more nobis prorsus incognito. Ut cæcus ideam non habet colorum, sic nos ideam non habemus modorum quibus Deus sapientissimus sentit et intelligit omnia. Corpore omni et figura carporea prorsus destituitur, ideoque videri non potest, nec audiri, nec tangi, nec sub specie rei alicujus corporea coli debet. Ideas habemus attributorum ejus, sed quid sit rei alicujus substantia minime cognoscimus." Lib. iii. De mundi systemate.

*It is refreshing to see that such a mind as that of Cuvier, in a country over which infidelity has swept like the pestilential wind of the desert, could be profoundly philosophical without loseing the sense of its own weakness in the sight of GOD. Cuvier was a believer, and openly professed his belief. While he sought as a philosopher to pursue the researches of natural science, and to establish results from experiment and observation, independently of the authority of Scripture, it would be vain to seek in his writings any evidence that his experiments or observations shock his faith. If, then, any fact which he has established should seem in any wise inconsistant with the Scripture history, let us wait, and not draw conclusions, till some further accession of knowledge may enable us to see the difficulties removed, and thus convince us that they were formed solely by our own ignorance.

of Europe asserts it, but we are not disheartened by the assertion. Our mighty experiment of self-government is far from being exhausted. We have not, it is true, the energy of despotic power which can command schools and colleges to spring into existence, can at once turn the stream of a nation's resources to the formation of cabinets of science, or the fine arts. But we have a nation, every individual of which feels that he is bounded only by the extent of those powers which GOD has given him; and the very basis of our institutions is, that every member of the republic is under a moral tie, that through him it should receive no detriment. We cannot by decree, transport from distant lands the granite rock, to serve as a pedestal for the statue of an emperor, but we can, by the subscription of a dollar, through the millions of our nation, erect a prouder monument to the memory of our Washington.

To this power, then, we appeal in behalf of natural science; and we ask our fellow-citizens to aid us in the establishment and maintenance of an institution the object of which is to promote the common good, by affording to all the means and opportunities of knowledge.

In our state of society, union is eminently strength; but as it would be vain to talk of colors to one who was born and continues blind, so will it be impossible to produce that union by which society may be exalted and refined, unless we extend the boundaries of intelligence. To dwell on the importance of diffusing a more perfect system of education might seem foreign from the present purpose; yet I may be permitted to quote the farewell advice of him who was first in the hearts of his countrymen, as a maxim of political and moral wisdom. "Promote, as an object of primary importance, institutions for the general diffusion of knowledge. In proportion as the structure of a government gives force to public opinion it should be enlightened."*

I hope that the day may come when, by private munificence, our public institutions shall be so well endowed as to render all instruction gratuitous; when the means of acquiring knowledge shall be as common and as free as the air we breathe; when the poorest member of our community may feel that he has an undivided share in the privileges which ennoble his nature; and when, by the equalizing power of Christian charity, "he that hath gathered much shall have nothing over, and he that hath gathered little shall have no lack."

CONTRIBUTIONS OF MISSIONARIES TO NATURAL SCIENCE.

The missionaries sent by the various religious denominations, either into our own territories, or into foreign countries, are, in general, educated men, and may do much to promote the cause of natural science, without any interruption to the duties of their profession. The example of the Roman Catholic missionaries is before our eyes; and the value of their labors in the cause of science is universally admitted. Little is known of China but what has been furnished by them. The French Jesuits, especially, have added greatly to the store of natural knowledge; yet no one can accuse them of neglecting their official duties.* Why, then, may not our missionaries, as a useful relaxation from their arduous labors, furnish us with collections, and with much curious information, respecting the natural history of the country in which they sojourn?

INTEREST OF EUROPEANS IN AMERICAN RESEARCHES.

That there are many in Europe who are eagar to form a correspondence with Americans, in the hope of exchanging the productions of the old world for those of the new, I can bear personal testimony. In Italy, several distinguished men spoke to me with ardor, and even with anxiety, on this subject. At Turin, the distinguished ornothologist, Bonelli, told me that he could furnish us with all the European birds enumerated by Temmick, if we would send him an equal number of American birds. Bonelli, alas! is no more; but he has left pupils who are following in his steps, and who, no doubt, would be glad to revive his offer. Dr. Grottanelli, of Sienna, offered to furnish us with minerals and plants on the same conditions. The younger Bartelone, of Bologna, would, I have no doubt, undertake the same pledge with regard to insects. In this manner we may, by our own labors, and by this scientific commerce, gradually form a collection the influence of which on the future character of our community, may be more extensive than we have now capacity to calculate. It is only during the feeble period of infancy, that such institutions require to be fostered with peculiar care. That period past, their existence can hardly be called precarious.

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* Washington's Farewell Address.

* No better example can be given of the acuteness exhibited by the Jesuits in their scientific researches, than the manner in which the Panax Quinquefolium or Gin-seng was discovered in America. This plant it is well known, is very highly esteemed for its medical virtues in China, and when prepared by clarification, is worth its weight in silver. As it is in their opinion a panacea, Linnæus gave it the name of Panax. The Jesuits, having been employed by the emperor to draw a map of Tartary from actual survey, arrived in July, 1709, at a village within ten or twelve miles of the kingdom of Corea, and near the mountains where the Gin-seng is found. Father Jartox received four roots from a Tartar, and taking one of them at random, he made an accurate drawing of it, which he sent to his superior in France, together with a map of the country where it grows, between N. lat 39° and 47° and E. lon. from Pekin 10° and 20°. He stated that it grows not in valleys, nor in marshes, nor in the bottom of ravines, nor in very open places, but on the sides of mountains covered with thick forests, around rocks, on the borders of ravines, at the foot of trees, and in the midst of every variety of herbage. If the forest should be consumed by fire, this plant does not reappear till three or four years afterward, which proves that it is an enemy of heat. In fact it conceals itself from the sun as much as possible. "All this," adds Father Jartoux, "makes me believe that *if it can be found in any other part of the world, it must be principally in Canada.*" In consequence of this suggestion, Father Lafiteau, a Jesuit missionary in Canada, was directed to search for it, and with the assistance of the drawings and descriptions of Jartoux, and the aid of the natives, he actually found it. He published an account of his discovery in 1718, and the American root became for a time, till the market was overstocked, an article of great commerce with China, and the source of much wealth. The word *Gin-seng*, Jartoux adds, signifies in Chinese, "the representation of a man;" for what reason he cannot tell. The Tartars call it *orhota*, which means "*the first of plants.*" See the original letter in the Lettres Edifiantes et Curieuses, vol. xviii. p. 127, of the new edition, and in the old edition, Tom. x. p. 159. See also Du Halde Hist. de la Chine, where it is copied word for word, vol. ii. p. 150, &c. A good abstract of the whole is to be found in Bigelow's Medical Botany, vol. ii. p. 82–96, and Barton's Medical Botany. vol. ii. p. 191–202. My attention was first directed to this fact by Dr. Barratt.

INDIANA IMPROVEMENTS.—A grand festival took place at Brookville, Ind., on the 13th ult., to mark the commencement of the White Water Canal. Upwards of 4,000 persons, it is estimated, were present, among whom were the most distinguished citizens of the State. The work, or a great portion of it, was put under contract the next day at Lawrenceburgh.

AMERICAN MANUFACTURES.—Many of our citizens do not seem to be aware of the extent and value of the manufactures of various kinds, which under the fostering care of the General Government, have grown up in our country within a few years, giving lucrative employment to many thousands of our citizens, and diffusing prosperity throughout the land. But comparatively a few years since, we were dependent on the work shops of Great Britain, for almost every article of clothing which we used.—Now we have extensive manufactories capable of supplying nearly all our wants.—In the year 1815, it is computed that the whole amount invested in woolen and cotton manufactures, was $12,000,000 the number of spindles in operation 500,000—the whole number of persons employed about 400,000. In 1822, the capital invested in woolen and cotton manufactures amounted to $116,439,000—employing 297,000 individuals. The raw materials annually worked up, amounted to $50,000—producing fabrics worth $87,000,000. The whole number of persons engaged in manufactures, and the families dependent on them, are supposed to amount to 2,872,000. The capital invested, in manufactures in 1823, was estimated at $300,000,000 and the annual production of manufactured goods, $161,000,000. And in addition to this, a home market for agricultural productions other than those worked up is created, amounting to $37,000,000. Since 1833, our manufactures have been constant-

ly advancing, and great additions have been made to the capital invested.

Such is the wonderful extent of the manufactures of America. And the importance of protecting this vast amount of active capital, which employs so large a portion of our population, from the dangerous competition of foreign fabric, must be apparent to every citizen, who will give the subject a moment's reflection. Our manufactures are not only sources of individual industry and profit, but of national wealth and independence. And may every attempt to diminish the prosperity of the country, by placing obstacles in the way of manufactures, be unsuccessful.—[Boston Mercantile.]

PEAT.—We perceive that the farmers around Taunton and in the adjoining towns are bringing large quantities of this valuable article into our markets. When the mode of using this species of fuel is better understood, and the cheapest method of getting out and curing it, is discovered by experiment and practice, we are of the opinion that it will in some degree supplant coal and wood. It is well known that it will retain fire longer than any other fuel; —it is very convenient therefore in chambers or other places where it is desirable to have fire constantly burning. It was used by some families here, last winter, in this way—at night they throw a few pieces into their grates, where they were accustomed to burn anthracite, and found a very comfortable fire in the morning. There is an inexhaustible fund of Peat in this vicinity. —[Taunton Whig.]

From the Journal of the Franklin Institute.

COMMUNICATION OF A FORMULA FOR FACILITATING THE REDUCTION OF OBSERVATIONS OF THE SOLAR ECLIPSE OF MAY 15TH, 1836.

BY S. C. WALKER.

TO THE COMMITTEE ON PUBLICATIONS.

GENTLEMEN: The formulæ communicated by me in the April number of the Journal, were intended for announcing the time of the principal phases of the solar eclipse of May 15. By applying a direction derived from observations made under a known meridian, they may be used for determining the longitude of places at which it was observed, when not too far distant from Philadelphia, for which place alone, they are strictly correct. The error of the middle time of the eclipse, as deduced from the formula, amounts of one second of time for New-York and Albany, to two seconds for Baltimore and Washington, and to eight seconds for Boston and the University of Virginia. By applying to the middle time by the formula, a correction depending upon the first and second powers of the difference of longitude from Philadelphia, results may be obtained, in which the greatest variation from a rigorous computation for the above places, will in no instance exceed 0. 6 sec., and in which the average discrepancy will not exceed 0. 4 sec. In the former communication it was omitted to mention that l, denotes the *geocentric* latitude of the place for which the computation is made.

Retaining the same notation and constants as before, we have for the resulting longitude for the place of observation from Greenwich, +East—West

$$\lambda = A + B + C$$

Where,

$$A = \lambda' + x + \left\{ M - M' \right\} - [8.8557] \left\{ D - D' \right\}$$

$$B = [4.9781] \left\{ 5\text{h. } 0\text{m. } 40\text{s.} + A \right\}^2 - [7.1701] \left\{ 5\text{h. } 0\text{m. } 40\text{s.} + A \right\}$$

$$C = -\tfrac{1}{5} \left\{ A + B\lambda - ' \right\}$$

In these equations

λ' = Assumed longitude from Greenwich, in seconds of time.
M = Local mean time of middle, observed,
M' = do. computed by formula.
D = Duration, observed.
D' = do. computed,
x = A correction for the errors of the tables.

The unknown quantity x, is the mean of the times at beginning and end, in which the moon by its apparent motion, traverses a space equal to the tabular error on its true orbit, projected upon its apparent orbit.—No material error will arise from assuming x, as constant for the limits to which this formula extends. Of the extent to which it may be used, an opinion may be formed from the following table, in which the middle time $M' + B$ derived from it, is compared with the rigorous computations for several places in the American Almanac.

Place.	M′	B.	Middle by Formula M′ + B	Middle by Am. Almanac.	Difference.
Philadelphia,	8 17 55.35	+0.00	8 17 55.35	8 17 54.75	+0.60 s.
Boston,	8 42 30.80	+7.73	8 42 38.53	8 42 38.90	—0.37
Providence,	8 39 42.55	+6.31	8 39 48.86	8 39 48.65	+0.21
Albany,	8 3 11.15	+0.60	8 30 11.75	8 30 11.80	—0.05
New-York,	8 25 1.45	+0.32	8 25 1.77	8 25 1.65	+0.12
Baltimore,	8 9 40.95	+1.69	8 9 42.64	8 9 43.20	—0.56
Washington,	8 6 58.30	+2.56	8 7 0.86	8 7 0.30	+0.56
University of Virginia.	7 58 10.33	+7.37	7 58 17.70	7 58 18.15	—0.45
					8)2.92

Greatest difference, 0. 6 sec. Mean difference, 0. 36 s.

The determination of x, requires observations under known meridians. This eclipse having been visible at European observatories, the value of x, will admit of accurate computation. If we assume the longitude of independence Hall, Philaddlphia, at 5h. 0m. 40s. west from Greenwich, we shall have, after correcting for the small differences of longtitude of several places of observation in Philadelphia, the following values of x,

Observations of R. M. Patterson, M. D.	$x =$	— 11.15 sec.
" T. M'Euen, M. D.	$x =$	— 9.67
" W. H. C. Riggs,	$x =$	— 11.40
" S. C. Walker,	$x =$	— 11.93
		44.15
Mean of four observations,	$x =$	— 11.04

Bs an application of the formula, let it be required to deduce the longitude of the Capitol at Washington, from the observations of F. R. Hassler, Esq. Latitude 38° 52′ 54.″ Beginning observed 6h. 53m. 58s. End at 9h. 20m. 8s., A. M. Mean time.

Computation of the longitude of the Capitol.		1st. Approximation.	2d. Approximation.
(1)....	assumed λ'	— 5h. 8m. 7.20	— 5h. 8m. 10.02
(2)....	assumed	— 11.04	— 11.04
	M	+ 8 7 3.00	+ 8 7 3.00
	M′	+ 8 6 58.30	+ 8 6 54.88
(3)....	M—M′	+ 4.70	+ 8.12
	D	+ 2 26 10.00	+ 2 26 10.00
	D′	+ 2 26 13.60	+ 2 26 12.24
	D—D′	— 3.60	— 2.24
(4).... — [8.8557]	$\left\{ D - D' \right\}$	+ 0.26	+ 0.20
(1)+(2)+(3)+(4)....	A	— 5 8 13.28	— 5 8 12.74
	5h. 0m. 40s.+A	— 7 33.28	— 7 32.74
(5) ....+ [4.9781]	$\left\{ 5\text{h. } 0\text{m. } 40\text{s.} + A \right\}^2$	+	+ 1.92
(6) ....— [7.1701]	$\left\{ 5\text{h. } 0\text{m. } 40\text{s.} + A \right\}$	+	+ 0.67
(5)+(6)	B	+ 2.56	+ 2.59
	A+B	— 5 8 10.72	— 5 8 10.15
	A+B—λ'	— 3.52	— 0.13
	$-\frac{1}{5}$. $\left\{ A+B-\lambda' \right\}$ =C	+ 0.70	+ 0 03
A+B+C	=λ	— 5 8 10.02	— 5 8 10.12

Similar computations from John Gummere's observations, give the longitude of Haverford School.

Observed beginning	7h.	3m.	24.5s.
" end	9	31	47.

" latitude	40°	1′	12″	
assumed	λ″	5h.	1m.	26.8s.
First approximation	λ′	5	1	16·94
2d "	λ	5	1	16.15

From the Journal of the Franklin Institute.

OBSERVATIONS OF THE SOLAR ECLIPSE OF MAY 15TH, 1836. COMMUNICATED BY DIRECTION OF THE AMERICAN PHILOSOPHICAL SOCIETY.

TO THE COMMITTEE ON PUBLICATIONS.

GENTLEMEN:—By direction of the American Philosophical Society, I send you an abstract of the observations of the late solar eclipse, which have been communicated to the Society. It is not complete, some particulars being required which will probably be obtained from the observers, by the committee to whom the observations have been referred, to prepare them for publication in the Society's transactions.

The times of beginning and end are in mean time of the places of observation.

Very respectfully yours,

A. D. BACHE,

One of the Secretaries, Amer. Philos. Soc.

Table of observations of the beginning and end of the solar eclipse of May 15th, 1836, as observed at Philadelphia, &c.

Places of Observation.	Time of beginning of Eclipse.	Time of end of Eclipse.	Observers' Name.	REMARKS.
Philadelphia.	h. m. s.	h. m. s.		
1. Hall of Am. Phil. Soc.	7 3 45.8	9 32 38.3	Dr. R. M. Patterson,	
2. Dr. McEuen's house,	7 3 38.0	9 32 38.1	Dr. T. McEuen,	2770 feet west of Philos. Hall.
3. "	7 3 50.0	9 32 26.5	Mr. W. H. C. Riggs,	
4. No. 100 S. 8th st.	7 3 40.9	9 32 44.1	Mr. S. C. Walker,	1340 feet west of Philos. Hall. Teles. 42 inches achrom.
5. No. 231 Market st.	7 3 41.0	*9 32 34.0	Mr. Sellers,	
Haverford school,†	7 3 24.5	9 31 4.07	Mr. Jno. Gummere,	Telescope 42 inch. achrom.
Germantown, Pa.	7 3 54.5	9 32 44.5	Mr. Isa. Lukens,	
	7 3 55.5	9 32 49.5	Mr. C. Wistar,	Telescope 3 feet achrom.
Phœnixville, Ches. co.‡	7 3 12.0		Mr. H. Wilson,	
West Hills, L. I.§	7 12 48.5	9 43 40.0	Mr. J. Ferguson,	Large repeating circle of coast survey, used for observations.
Washington City,	6 53 58.0	9 20 08.0	Mr. F. R. Hassler,	

* Doubtful.

† Assumed lat. 40° 01′ 12″. Long. 5h.01m. 25s.

‡ Assumed lat. 40° 08′ 07″ Long. deduced by H. Wilson, from eclipse, 5h. 01m. 57s.

§ One of the station points of the coast survey. Lat. 40° 48′ 49.2″. Long. 73° 26′ 12″.

From the Farmers' Magazine of 1812.

ON THE DIFFERENCE IN THE EFFECT OF DUNG UPON DIFFERENT SOILS—AND UPON THE SAME LAND BEFORE AND AFTER IT HAS BEEN LIMED.

[The following communication is from the aged and venerable farmer who has been sometimes honored, and not undeservedly, by the name of the "Father of Scottish Husbandry"—and it deserves attention, not only for the truth and value of the opinions it conveys, but for the novelty and rareness of their appearance. So far as we know, this is the only instance, before the first publication of the *Essay on Calcareous Manures*, (and this was not known until after that publication,) of its being maintained by any book, or writer, that natural poor soils cannot be profitably and durably enriched by dung alone, until after they have been limed. The deductions from Mr. Dawson's statements accord entirely with the opinions maintained in the work referred to, as to the effects of manure on poor soils.

The concise memoir of Dawson, which will follow, is from a later volume of the same work, (in 1815,) published after his death.]

That dung produces much greater effect upon good than upon bad land, when in tillage, is generally known, though not so fully attended to as it ought to be; but the difference in its effects upon different kinds of land, when in grass, though much more considerable, has been very little observed; notwithstanding it is obvious that the dung of animals has a great effect upon all pastures which consist of what are called the finer grasses; that it has scarcely any upon land that is covered with bent-grass, or fog; and that it is of more or less value upon pastures, as herbage of the former or latter description predominates.

As accidental circumstances directed my attention more particularly to these consequences, it may be of use to publish an account of them in your Magazine, so far as they have been ascertained by my own experience; since it may induce some of your readers to communicate other facts and observations illustrative of this important subject.

In the year 1754, having occasion to carry a quantity of very fine black loam from a head-ridge of old infield land, to give the surface-water a free passage, it was laid upon outfield benty grass land adjoining, of which it covered about a quarter of an acre fully one inch thick. No grass seeds were sown upon this new covering; yet white clover, and other fine grasses, sprung up and gradually increased upon it; and the bent, upon which the loam was laid, diminished so speedily, that very little of it remained in the third year thereafter.

A few years after this, having a considerable extent of outfield land in fallow, which I wished to lime previous to its being laid down to pasture, and finding that I could not obtain a sufficient quantity of lime for the whole in proper time, I was induced, from observing the effects of the fine loam upon the surface of a similar soil, even when covered with bent, to try a small quantity of lime on the surface of a part of this fallow, instead of a larger quantity ploughed down in the usual manner. Accordingly, in the autumn, about twenty acres of it was well harrowed, and then about fourteen Winchester bushels only of unslacked lime was, after being slacked, carefully spread upon each English acre, and immediately well harrowed in. As many pieces of the lime, which had not been fully slacked at first, were gradually reduced to powder by the dews and moisture of the earth—to mix that with the soil, the land was again well harrowed in three or four days thereafter. This land was sown in the spring with oats, with white and red clover and rye-grass seeds, and well harrowed, without being ploughed again. The crop of oats was good; the plants of grass sufficiently numerous and healthy; and they formed a very fine pasture, which continued good until ploughed, and years after, for corn.

About twelve years afterwards, I took a lease of the hilly farm of Grubbet; many parts of which, though of an earthy mould tolerably deep, were too steep and elevated to be kept in tillage. As these had been much exhausted by cropping, and were full of couch-grass, to destroy that, and procure a cover of fine grass, I fallowed them, and laid on the same quantity of lime per acre, —then harrowed, and sowed oats and grass seeds in the spring; exactly as in the last mentioned experiment. The oats were a full crop, and the plants of grass abundant. Several of these fields have been now above thirty years in pasture, and are still producing white clover and other fine grasses; no bent or fog has yet appeared upon them.—It deserves particular notice, that more than *treble* the quantity of lime was laid upon fields adjoining of a similar soil, but which, being fitter for occasional tillage, upon them the lime was ploughed in. These fields were sowed with oats and grass seeds. The latter throve well, and gave a fine pasture the first year; but afterwards the bent spread so fast, that, in three years, there was more of it than of the finer grasses.

In all these instances, where the lime was only harrowed in, and not ploughed down, the land not only continued to produce the fine grasses, but the dung of the animals feeding upon them had the same effect in increasing the quantity and verdure of the grass, as it has upon rich, loamy, infield soils; of this, the parts of Grubbet hills, above alluded to, afford a full proof at this day. Whereas, wherever the lime was ploughed down, the parts of the soil at the surface, which were not sufficiently mixed with lime, though sown with clovers, became gradually covered with bent; and dung of the animals had little or no effect upon such benty parts. That animal dung

has little or no beneficial effect upon such pastures, is obvious from this circumstance, that in all hilly countries, there are great tracts of benty grass land, which have continued for centuries, though constantly pastured with sheep or cattle, without any visible improvement; the animal dung neither increasing the quantity, nor improving the quality of the pasture. But it is still more remarkable that dung has no permanent effect upon such soils, even when ploughed down, as appears from the following facts.

In the year 1756, about five acres of earthy outfield benty land, were folded with sod-dikes, and very well dunged, with the intention of ploughing it for oats; but upon determining, afterwards, to enclose about sixty acres to be continued in pasture, of which these five acres made a part, the intention of ploughing these folds was given up; and the dikes were thrown down in the spring, well harrowed, and sown with rye-grass. The effect of the dung upon that land was very considerable the first year, a great deal less so the second, very little the third, and was not visible afterwards. Seven years thereafter, it was ploughed for oats along with the rest of the field, when the effects of the dung were expected to be considerable; but the crop was no better upon the folded part, than upon the others; nor was it any better upon the sides of the sod-dykes, where the dung had been at first fully covered in by the earth of the sods.

Some years afterwards, about ten acres of benty outfield was fallowed, and intended to be limed; but, for particular reasons, no part of it was limed. One half of it, however, was dunged from the farm-yard. The whole field was sown with oats and rye-grass seeds. The crop of oats was much better upon the part that was dunged, as was also the rye-grass the first year; but the bent spread so fast upon both parts, that no rye-grass was left the fourth year, nor was there any greater verdure upon the part that was dunged than upon the other part. When the whole field was ploughed some years after, there was no visible difference in the crops between the two parts: the crop upon both was very bad.

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I am, sir, yours, &c.

WILLIAM DAWSON.

Edinburgh, 2d March, 1812.

(To be Continued)

IMPORTANT DISCOVERY.

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Similar computations from John Gummere's observations, give the longitude of Haverford School.

Observed beginning	7h.	3m.	24.5s.
" end	9	31	47.

" latitude	40°	1′	12″	
assumed	λ″	5h.	1m.	26.8s.
First approximation	λ′	5	1	16·94
2d "	λ	5	1	16.15

From the Journal of the Franklin Institute.

OBSERVATIONS OF THE SOLAR ECLIPSE OF MAY 15TH, 1836. COMMUNICATED BY DIRECTION OF THE AMERICAN PHILOSOPHICAL SOCIETY.

TO THE COMMITTEE ON PUBLICATIONS.

GENTLEMEN:—By direction of the American Philosophical Society, I send you an abstract of the observations of the late solar eclipse, which have been communicated to the Society. It is not complete, some particulars being required which will probably be obtained from the observers, by the committee to whom the observations have been referred, to prepare them for publication in the Society's transactions.

The times of beginning and end are in mean time of the places of observation.

Very respectfully yours,

A. D. BACHE,

One of the Secretaries, Amer. Philos. Soc.

Table of observations of the beginning and end of the solar eclipse of May 15th, 1836, as observed at Philadelphia, &c.

Places of Observation.	Time of beginning of Eclipse.	Time of end of Eclipse.	Observers' Name.	REMARKS.
Philadelphia.	h. m. s.	h. m. s.		
1. Hall of Am. Phil. Soc.	7 3 45.8	9 32 38.3	Dr. R. M. Patterson,	
2. Dr. McEuen's house.	7 3 38.0	9 32 38.1	Dr. T. McEuen,	2770 feet west of Philos. Hall.
3. "	7 3 50.0	9 32 26.5	Mr. W. H. C. Riggs,	
4. No. 100 S. 8th st.	7 3 40.9	9 32 44.1	Mr. S. C. Walker,	1340 feet west of Philos. Hall. Teles. 42 inches achrom.
5. No. 231 Market st.	7 3 41.0	*9 32 34.0	Mr. Sellers,	
Haverford school,†	7 3 24.5	9 31 4.07	Mr. Jno. Gummere,	Telescope 42 inch. achrom.
Germantown, Pa.	7 3 54.5	9 32 44.5	Mr. Isa. Lukens,	
	7 3 55.5	9 32 49.5	Mr. C. Wistar,	Telescope 3 feet achrom.
Phœnixville, Ches. co.‡	7 3 12.0		Mr. H. Wilson,	
West Hills, L. I.§	7 12 48.5	9 43 40.0	Mr. J. Ferguson,	Large repeating circle of coast survey, used for observations.
Washington City,	6 53 58.0	9 20 08.0	Mr. F. R. Hassler,	

*Doubtful.

†Assumed lat. 40° 01′ 12″. Long. 5h. 01m. 25s.

‡Assumed lat. 40° 08′ 07″ Long. deduced by H. Wilson, from eclipse, 5h. 01m. 57s.

§One of the station points of the coast survey. Lat. 40° 48′ 49.2″. Long. 73° 26′ 12″.

From the Farmers' Magazine of 1812.

ON THE DIFFERENCE IN THE EFFECT OF DUNG UPON DIFFERENT SOILS—AND UPON THE SAME LAND BEFORE AND AFTER IT HAS BEEN LIMED.

[The following communication is from the aged and venerable farmer who has been sometimes honored, and not undeservedly, by the name of the "Father of Scottish Husbandry"—and it deserves attention, not only for the truth and value of the opinions it conveys, but for the novelty and rareness of their appearance. So far as we know, this is the only instance, before the first publication of the *Essay on Calcareous Manures*, (and this was not known until after that publication,) of its being maintained by any book, or writer, that natural poor soils cannot be profitably and durably enriched by dung alone, until after they have been limed. The deductions from Mr. Dawson's statements accord entirely with the opinions maintained in the work referred to, as to the effects of manure on poor soils.

The concise memoir of Dawson, which will follow, is from a later volume of the same work, (in 1815,) published after his death.]

That dung produces much greater effect upon good than upon bad land, when in tillage, is generally known, though not so fully attended to as it ought to be; but the difference in its effects upon different kinds of land, when in grass, though much more considerable, has been very little observed; notwithstanding it is obvious that the dung of animals has a great effect upon all pastures which consist of what are called the finer grasses; that it has scarcely any upon land that is covered with bent-grass, or fog; and that it is of more or less value upon pastures, as herbage of the former or latter description predominates.

As accidental circumstances directed my attention more particularly to these consequences, it may be of use to publish an account of them in your Magazine, so far as they have been ascertained by my own experience; since it may induce some of your readers to communicate other facts and observations illustrative of this important subject.

In the year 1754, having occasion to carry a quantity of very fine black loam from a head-ridge of old infield land, to give the surface-water a free passage, it was laid upon outfield benty grass land adjoining, of which it covered about a quarter of an acre fully one inch thick. No grass seeds were sown upon this new covering; yet white clover, and other fine grasses, sprung up and gradually increased upon it; and the bent, upon which the loam was laid, diminished so speedily, that very little of it remained in the third year thereafter.

A few years after this, having a considerable extent of outfield land in fallow, which I wished to lime previous to its being laid down to pasture, and finding that I could not obtain a sufficient quantity of lime for the whole in proper time, I was induced, from observing the effects of the fine loam upon the surface of a similar soil, even when covered with bent, to try a small quantity of lime on the surface of a part of this fallow, instead of a larger quantity ploughed down in the usual manner. Accordingly, in the autumn, about twenty acres of it was well harrowed, and then about fourteen Winchester bushels only of unslacked lime was, after being slacked, carefully spread upon each English acre, and immediately well harrowed in. As many pieces of the lime, which had not been fully slacked at first, were gradually reduced to powder by the dews and moisture of the earth—to mix that with the soil, the land was again well harrowed in three or four days thereafter. This land was sown in the spring with oats, with white and red clover and rye-grass seeds, and well harrowed, without being ploughed again. The crop of oats was good; the plants of grass sufficiently numerous and healthy; and they formed a very fine pasture, which continued good until ploughed, and years after, for corn.

About twelve years afterwards, I took a lease of the hilly farm of Grubbet; many parts of which, though of an earthy mould tolerably deep, were too steep and elevated to be kept in tillage. As these had been much exhausted by cropping, and were full of couch-grass, to destroy that, and procure a cover of fine grass, I fallowed them, and laid on the same quantity of lime per acre, —then harrowed, and sowed oats and grass seeds in the spring; exactly as in the last mentioned experiment. The oats were a full crop, and the plants of grass abundant. Several of these fields have been now above thirty years in pasture, and are still producing white clover and other fine grasses; no bent or fog has yet appeared upon them.—It deserves particular notice, that more than *treble* the quantity of lime was laid upon fields adjoining of a similar soil, but which, being fitter for occasional tillage, upon them the lime was ploughed in. These fields were sowed with oats and grass seeds. The latter throve well, and gave a fine pasture the first year; but afterwards the bent spread so fast, that, in three years, there was more of it than of the finer grasses.

In all these instances, where the lime was only harrowed in, and not ploughed down, the land not only continued to produce the fine grasses, but the dung of the animals feeding upon them had the same effect in increasing the quantity and verdure of the grass, as it has upon rich, loamy, infield soils; of this, the parts of Grubbet hills, above alluded to, afford a full proof at this day. Whereas, wherever the lime was ploughed down, the parts of the soil at the surface, which were not sufficiently mixed with lime, though sown with clovers, became gradually covered with bent; and dung of the animals had little or no effect upon such benty parts. That animal dung

has little or no beneficial effect upon such pastures, is obvious from this circumstance, that in all hilly countries, there are great tracts of benty grass land, which have continued for centuries, though constantly pastured with sheep or cattle, without any visible improvement; the animal dung neither increasing the quantity, nor improving the quality of the pasture. But it is still more remarkable that dung has no permanent effect upon such soils, even when ploughed down, as appears from the following facts.

In the year 1756, about five acres of earthy outfield benty land, were folded with sod-dikes, and very well dunged, with the intention of ploughing it for oats; but upon determining, afterwards, to enclose about sixty acres to be continued in pasture, of which these five acres made a part, the intention of ploughing these folds was given up; and the dikes were thrown down in the spring, well harrowed, and sown with rye-grass. The effect of the dung upon that land was very considerable the first year, a great deal less so the second, very little the third, and was not visible afterwards. Seven years thereafter, it was ploughed for oats along with the rest of the field, when the effects of the dung were expected to be considerable; but the crop was no better upon the folded part, than upon the others; nor was it any better upon the sides of the sod-dykes, where the dung had been at first fully covered in by the earth of the sods.

Some years afterwards, about ten acres of benty outfield was fallowed, and intended to be limed; but, for particular reasons, no part of it was limed. One half of it, however, was dunged from the farm-yard. The whole field was sown with oats and rye-grass seeds. The crop of oats was much better upon the part that was dunged, as was also the rye-grass the first year; but the bent spread so fast upon both parts, that no rye-grass was left the fourth year, nor was there any greater verdure upon the part that was dunged than upon the other part. When the whole field was ploughed some years after, there was no visible difference in the crops between the two parts: the crop upon both was very bad.

But from the following fact it appears, that upon that sort of soil, when properly mixed with lime, the effects of dung are not only greater, but much more permanent, whether under tillage or pasture. After laying at least fifty bushels of unslacked lime upon each English acre of the dry benty land of the farm of Frogden, I cropped it in what was then called the Norfolk rotation; viz. 1st year, Turnip; 2d, Barley or Oats; 3d, Grass; and, 4th, Oats or Wheat. It was expected that this mode of cropping would not exhaust the land; but I found, even in the second round, that the crops were so very much worse on the thin soils, that it was necessary to allow the land to continue some years in pasture to recover its fertility; and for that purpose it was sown with equal quantities of red, white, and yellow clovers, with a small portion of rye-grass seeds. As the land had been twice fallowed, and carried three crops of turnips horse-hoed after liming, and had never been ploughed deep, the surface-soil was well mixed with lime; and accordingly, the clovers were not afterwards injured by the native bent. But as the land had been exhausted by cropping, sheep were folded upon it in nets the first summer. Their dung greatly increased the quantity and richness of the pasture; and though the effect was less the next year, it continued to be considerable, and the pasture seemed still improving after the third year. After being six years in grass, the land was ploughed up, and produced full crops. As the soil of the fields treated in this manner was in every respect similar to that of the five acres which were folded in 1756, and to the soil of the field of ten acres, half of which was dunged from the farm yard, as already mentioned, the very great superiority i.. the permanency of the effects of dung in the latter instance, over that in the two former, can only be imputed to the lime.

From the preceding statement, the following conclusions deserve the attention of agriculturists.

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(To be Continued)

IMPORTANT DISCOVERY.

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the proprietors, on the quality, quantity, and mode of working it efficiently.

I do not enter into a description of this singular coal, because we are preparing a separate communication for a scientific institution.

It is extremely probable that this coal, which contains so remarkable a proportion of bitumen, will be exported from the Havana to most of the ports of the southern extremity of this continent.

I may add that coal occurs near the north-east end of Jamaica. Mr. De la Beche informs me, however, that these coal seams are very thin, and that none of sufficient magnitude to render them worth working have been discovered.

I am, gentlemen, respectfully,
RICHARD O. TAYLOR.
Philadelphia, July 13, 1836.

A letter has been received at Lloyd's from the Consul at Coyumbo, warning the underwriters against insuring copper ores from that coast, as dangerous to the ship. It appears from the report of gentlemen employed to examine a vessel in that place that they found the ore in such a heated state as to endanger the safety of the vessel if retained on board for any longer period. They found the calcined copper ore in such a state of heat as to be unbearable to the touch, and that on trying with a thermometer they found the mercury rose to 132 degrees of Farenheit. The cause was said to be the great proportion of sulpher contained in the copper ore, and from its having been shipped in a damp or humid state. The other document is a letter to the charterers confirmatory of the other communication, stating that a small hole was dug one foot below the surface of the ore, and the thermometer was introduced, and after remaining there five minutes, the mercury rose to 162 degrees, and that he felt justified in taking no more than 75 tons, which could be placed on the decks with safety.—[Herald.]

SALSIFY.—Though the salsify, or as it is commonly called on account of its assimilation in taste to the oyster, the "vegetable oyster," is one of the most delicious of our garden roots, yet its uses are not generally known or its culture attended to. It is a biennial plant of English origin, and in appearance resembles a small parsnip. It is easy of cultivation, and when parboiled, cut in slices length wise and fried in butter, possesses a flavor so nearly allied to the oyster, that even epicures sometimes find it difficult to distinguish between them. In cultivating this root, the ground should be manured and prepared in the same manner as for beets, carrots or parsnips, and the seed sown in drills at the same distances. The seed should then be covered about half an inch deep, and the surface of the ground rolled down to bring it in contact with the seed, and enable it to germinate. When the plants are up they should be thinned and kept free of weeds. Late in the fall the roots may be dug, and if packed in sand and deposited in the cellar, will keep fresh till the following spring. The root is smaller than the parsnip, and consequently the product from the same quantity of land is not as great; yet from good land, well cultivated, a liberal crop may be obtained.

We think gardeners in the vicinity of large towns, would find it to their account in cultivating this root for the supply of their markets, as most persons acquainted with it are extravagantly fond of it. It is said to be in much demand in the Boston market.—[N. E. Farmer.]

ALLUM AND COPPERAS MINE.—The late discovery made by Mr. Joseph S. Loomis upon his farm in Sheridan, of a mine of Allum and Copperas in propertion of two thirds of the former and one of the latter, is about to prove a valuable acquisition to the resources of the county, as well as very profitable to Mr. Loomis himself, who has ascertained the bed to be very extensive.—[Dunkirk Beacon.]

A gentleman in Scotland says that he has discovered the cause of the failure in the potatoe crop to be the partial or total destruction of the sets by a sort of centipede, one of which insects he has examined with a microscope, and describes as follows:—They are in length about half an inch, and have in their bodies 32 joints; each joint has five legs on each side of the body—in all 320. Their color is a light dun with red spots, and the body itself is transparent.—Their heads are furnished with large horns, and their motions, when taken from the potatoe, was quick and lively; and when a small piece of the potatoe was laid upon the glass beside one of the animals, it was immediately approached and greedily devoured. The animal was observed in all its stages from the ova to the complete formation, and as none was discovered in any instance in the earth around the plant, it would appear that these insects are generated in the potatoe itself.—[Scotsman.]

Silk Cocoons have been left at our office from the House of Industry, at South Boston. They are from eggs this year, a second crop. The worms came out August 26th, were kept in an even temperature of about 70° and spun in thirty days.—[New-England Farmer.]

METEOROLOGICAL RECORD

For the month of June, 1836, kept at Avoylle Ferry, Red River, La., (Lat. 31° 10′ N. Long. 91° 59′ W.,) by P. G. VOORHIES.

JUNE.

Days.	Morn.	Noon.	Night.	Wind.	Weather.	REMARKS.
1	72	82	74	calm	clear	
2	67	82	76	w	..	
3	68	82	77	sw	..	
4	65	77	74	calm	cloudy	at noon clear
5	62	78	76	..	..	
6	71	88	82	sw	clear	
7	71	89	64	s	..	
8	70	89	86	calm	cloudy	
9	71	90	86	..	..	
10	84	89	87	sw	clear	
11	74	89	84	calm	..	Red River falling
12	72	86	78	NE	..	
13	68	86	73	E	..	
14	70	86	73	calm	..	
15	68	85	76	..	..	
16	69	88	77	sw	cloudy	showers in the morning from sw
17	71	88	76	calm	..	distant thunder
18	74	86	74	sw	..	showers in the evening, heavy rain at night;
19	71	84	76	SE	..	heavy rain at night
20	68	85	76	sw	clear	
21	69	89	76	..	..	
22	74	88	84	calm	cloudy	heavy thunder in the afternoon
23	76	74	75	sw	..	thunder and rain at noon and all night
24	76	86	78	calm	clear	
25	74	86	78	sw	..	
26	76	86	84	..	..	
27	75	87	83	calm	..	
28	76	88	83	..	..	
29	76	86	74	..	cloudy	showers, rain at noon
30	72	86	82	..	clear	

FARMS FOR SALE.

IN the towns of Beekman, Dover, and Union-Vale, belonging to Mr. DELAFIELD.

The COUNTRY SEAT now occupied by Mr. Charles Delafield, is beautifully situated on a rise of land, commanding a fine prospect. This farm contains 131 acres.—The soil is of the first quality, and easily cultivated. The buildings are entirely new, and cost $6,000. The grounds are in fine order. On this farm is a very fine orchard; also a variety of fruit. A large proportion of this farm is meadow land.

Also, THREE FARMS of 740 acres, with good buildings, viz: dwelling house, three barns, and other out buildings, all in good repair—450 acres now under cultivation, besides 100 acres meadow land. The timber land is mostly very heavy, consisting of oak and chestnut timber; the rest is second growth and very thrifty. On the premises are a *saw mill* and good orchard. This farm is pleasantly situated and may be divided into lots to suit purchasers. It is a very fine grazing farm.

Also, a FARM of 140 acres, 100 acres now under cultivation, 25 acres meadow land. The land is easy to till. There are fine orchards and a great variety of fruit on this farm. Buildings good. This may also be divided into smaller lots.

Also, a FARM of 80 acres; about 50 acres under cultivation, and 15 acres of meadow land. The soil of the best quality. Has fine orchards and good timber land.

Also, TWO FARMS of 120 acres; 60 acres improved land of an excellent quality. It has some fine timber land and good orchards.

Also, a FARM of 200 acres situated in the neighborhood of some of the pleasantest and best farms in Duchess county. It has 150 acres of land under cultivation, and as good soil as any in Duchess county. The view from this farm is splendid, and forms a desirable spot for a gentleman's country seat. It has good buildings and out-houses, and some fine timber land.

Also, a FARM of 34 acres, all under cultivation, of the finest quality of land.—This farm lies directly on the new turnpike road. On it is a commodious dwelling house, and now occupied as a tavern. The out-buildings are very good.

Also, a FARM of 240 acres, of an excellent quality, about 160 acres of improved land. This farm lies directly on the turnpike. The buildings are very good, being built last year. The timber is heavy, and the farm is in good fence.

Also, a FARM of 240 acres, beautifully situated, 130 acres under cultivation. The soil is of a very fine quality. Buildings nearly new and in good order. There are two new barns on this farm.

Also, a FARM of 210 acres of a strong, deep soil of land, about 130 acres under cultivation. Buildings good. The farm is almost all meadow land, and has good orchards. It can be divided.

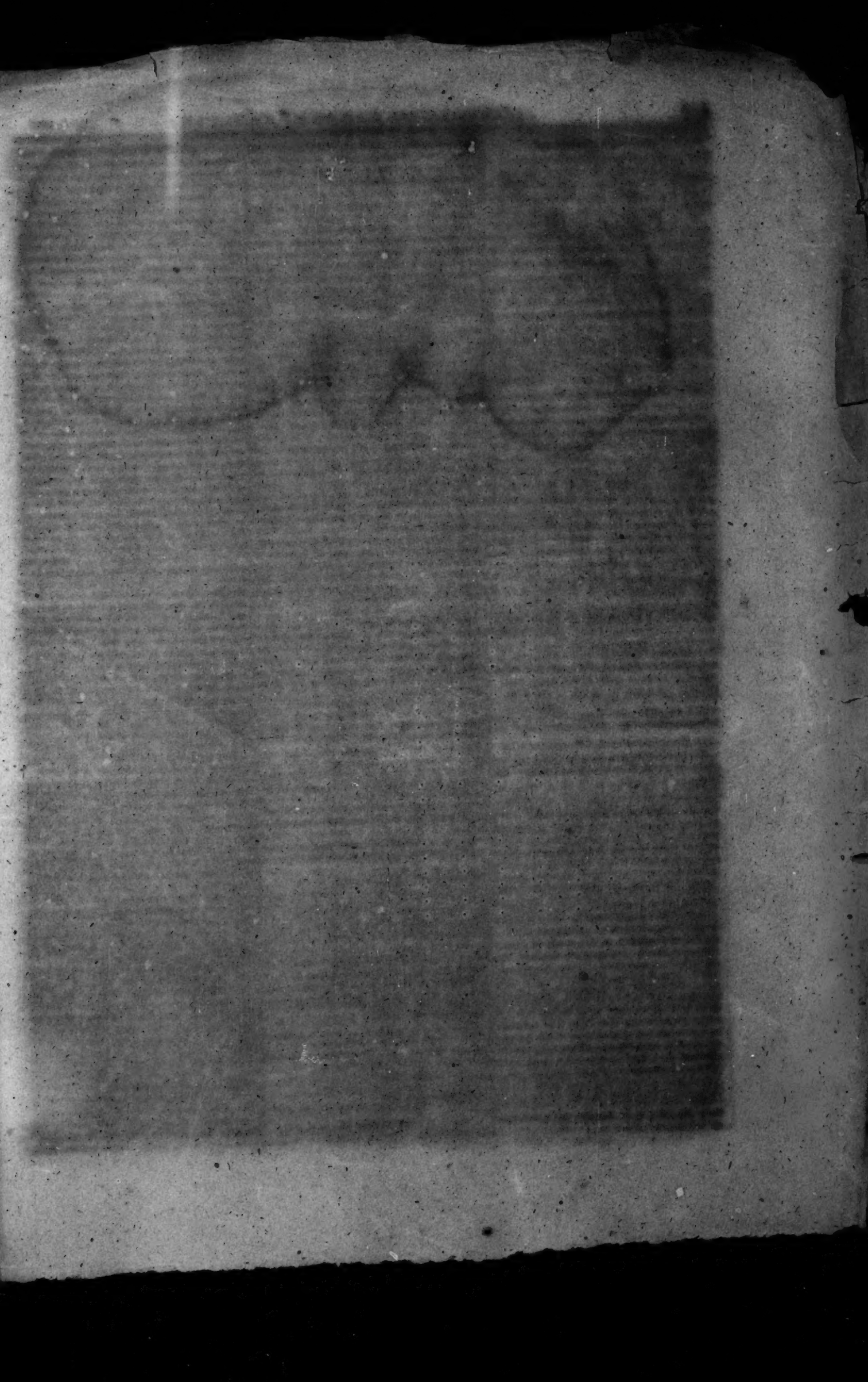
Also, a FARM of 400 acres; 50 acres of it is improved land and of good quality; about 200 acres of heavy timber land, and can be divided to suit purchasers.

Also, 500 acres of heavy TIMBER LAND, near the Dover Iron Works, and adjoining the red mill of Thomas Vincent.

For terms apply to JAMES MILLS and JONATHAN P. CLARK, Poughkeepsie; BENJAMIN SHERMAN, Clove, Union-Vale; GRANT THORBURN, New-York; or to

CHARLES DELAFIELD,
On the premises.

☞ The above farms will be sold very low. Oct. 15,3 times.



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